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BOUNDARY LAYER DUST OCCURRENCE
IV
ATMOSPHERIC DUST OVER SELECTED
GEOGRAPHICAL AREAS

Data Report

By

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June 1977

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This is the fourth in a series of reports designed to provide a guide to the occurrence of atmospheric dust over selected geographical areas. Tabular data on the duration and on the diurnal and monthly variations in the probability of occurrence of blowing dust (visibility less than 11 km) and of dust storms (visibility less than 1 km) are presented for 45 stations which averaged at least 3.7 days per year (1%) with blowing dust. The 45 stations were geographically distributed as follows:		

19. KEY WORDS (cont)

South Korea
Peru
Spanish Sahara
Venezuela

20. ABSTRACT (cont)

Angola (2), Australia (1), China (1), Italy (1), Mali (13), Mauritania (11), Mexico (4), Niger (5), North Korea (1), Peru (2), South Korea (1), Spanish Sahara (2), and Venezuela (1). For 257 stations (in 35 countries) which averaged less than 3.7 days per year with blowing dust, tabular dust data are limited to the mean annual number of days with blowing dust and dust storms.

PREFACE

The authors thank SGT Robert Carroll, Jr., for his assistance in compiling these data and Wendell Watkins for his helpful suggestions during the preparation of this report.

CONTENTS

	<u>Page</u>
PREFACE	1
INTRODUCTION	3
DEFINITIONS	3
BACKGROUND	4
GEOGRAPHICAL COVERAGE	4
OCCURRENCE	4
SUMMARY	5
REFERENCES	5
FIGURES	6
TABLES	12
STATION SUMMARIES	12
OCCURRENCE OF DUST	30
INDEX - STATIONS ALPHABETICALLY SUMMARIZED	75

INTRODUCTION

Airborne dust (and sand) is one of the most damaging environmental elements. A dusty atmosphere may contribute to the deterioration of materials and can present serious problems in the operation and maintenance of mechanical and electrical equipment. Moreover, atmospheric dust is a limiting factor in the propagation of electromagnetic energy through the atmosphere.

The primary purpose of this series of reports is to provide a guide to the occurrence of atmospheric dust over selected geographical areas. Part I presented data from two stations in the White Sands Missile Range, New Mexico, area [1]. Part II summarized data on the occurrence of dust at 135 stations in the Middle East, Near East, and North Africa [2]. Part III summarized data on the occurrence of dust at 214 stations in Russia [3]. The purpose of Part IV is to complete the coverage with occurrence data for an additional 302 stations from widely scattered geographical areas.

In Part IV the 302 stations are divided into two categories: those experiencing visibility restrictions by airborne dust at the 1% and greater level (at least 3.7 days per year) and those at less than the 1% level (including 73 stations having no observations of visibility restrictions by airborne dust). For the 45 stations in the former category, individual tables provide the average diurnal variation by month of the likelihood of dust-restricted visibility and average duration factors representing the likelihood of dust-restricted visibility lasting at least 1, 3, 6, 9, 12, and 24 hours. The period of record for these 45 stations had to be at least five years. For the 257 stations at the less than 1% level, a single tabular summary covers the mean annual number of days with dust storms and blowing dust. Stations in this category did not have to meet the five-year requirement.

DEFINITIONS

BLOWING DUST: Dust raised by the wind to moderate heights above the ground and restricting horizontal visibility to less than 7 miles* (11 km).

DUST STORM (including severe): The same as blowing dust, except visibility is reduced to less than 5/8 mile* (1 km).

NUMBER (N) OF DUST OCCURRENCES: The arithmetic mean of the annual number of occurrences of dust equal to or greater than 1 hour duration.

*Federal Meteorological Handbook No. 1, Surface Observations, Change 3, 1 Jul 75.

BACKGROUND

Questions arise on the likelihood of blowing dust or dust storms occurring at a specific time of day and/or month of the year and on the likelihood of their lasting for a specified period of time. In response to a request from the Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, NM, The United States Air Force, Air Weather Service [Environmental Technical Applications Center (ETAC)] tailored an analysis of available magnetic tape records of three hourly (i.e., a single observation taken every 3 hours) weather observations from 651 worldwide stations to answer these questions.

GEOGRAPHICAL COVERAGE

Part IV covers 302 stations. The geographical distribution of these stations is indicated in Figures 1-6. The latitude, longitude, elevation, and World Meteorological Organization (WMO) number for each station are listed in Tables 1-4.

OCCURRENCE

More than 3.7 Days Per Year with Blowing Dust

The data on the variability of the occurrence of dust at each of the 45 stations are contained in Tables 5 through 49. Each table consists of two parts. One part gives the diurnal variation of the occurrence of each of the two visibility classes (less than 1 km and less than 11 km) by month. The percentages represent averages for the period of record and are based on data actually taken at the specified hours. The second part contains the duration factor, in decimal percent, of visibilities reduced to less than 1 km and less than 11 km for periods greater than or equal to 1, 3, 6, 9, 12, and 24 hours.* To find the percent likelihood of a given visibility condition lasting for a certain period of time at a specified hour and month at a specific site, multiply the duration factor by the occurrence. For example, the likelihood of the visibility being less than 11 km for at least 9 hours beginning at 0500 LST in April at Khotan, China (Table 39), is approximately 25 percent (0.50 X 50 percent).

*The original data was acquired at intervals of 3 hours. Thus, a given dust condition which lasted 3 hours or more would be recorded at least once and dust-restricted visibilities of shorter duration may or may not have been recorded. For the purposes of this report, it is assumed that if the visibility is reported as being reduced by dust at a given three hourly observation then that condition lasted at least 1 hour, ergo, a duration factor of 1.00 for blowing dust and dust storms lasting at least 1 hour.

Less Than 3.7 Days Per Year with Blowing Dust

Of the original 651 stations for which the ETAC provided data, 257 stations were not included in Parts I, II, and III and were not among those 45 stations of Part IV which were characterized by more than 3.7 days per year with blowing dust and a period of record of 5 years or more. These stations are listed alphabetically by country in Table 4. Included in the listing are period of record, WMO number, latitude, longitude, elevation, and annual number of days with blowing dust and dust storm.

SUMMARY

For the 45 stations covered, the patterns of occurrence are similar with the highest frequency of occurrence being centered in the late afternoon in spring and early summer. The period of record is not identical for all stations; therefore, caution is urged where comparisons between or among stations is required.

REFERENCES

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3. Hinds, B. D. and G. B. Hoidale, 1977, "Boundary Layer Dust Occurrence. III. Atmospheric Dust over Russia," ECOM-DR-77-2, Atmospheric Sciences Laboratory, US Army Electronics Command, White Sands Missile Range, NM, 388 pp

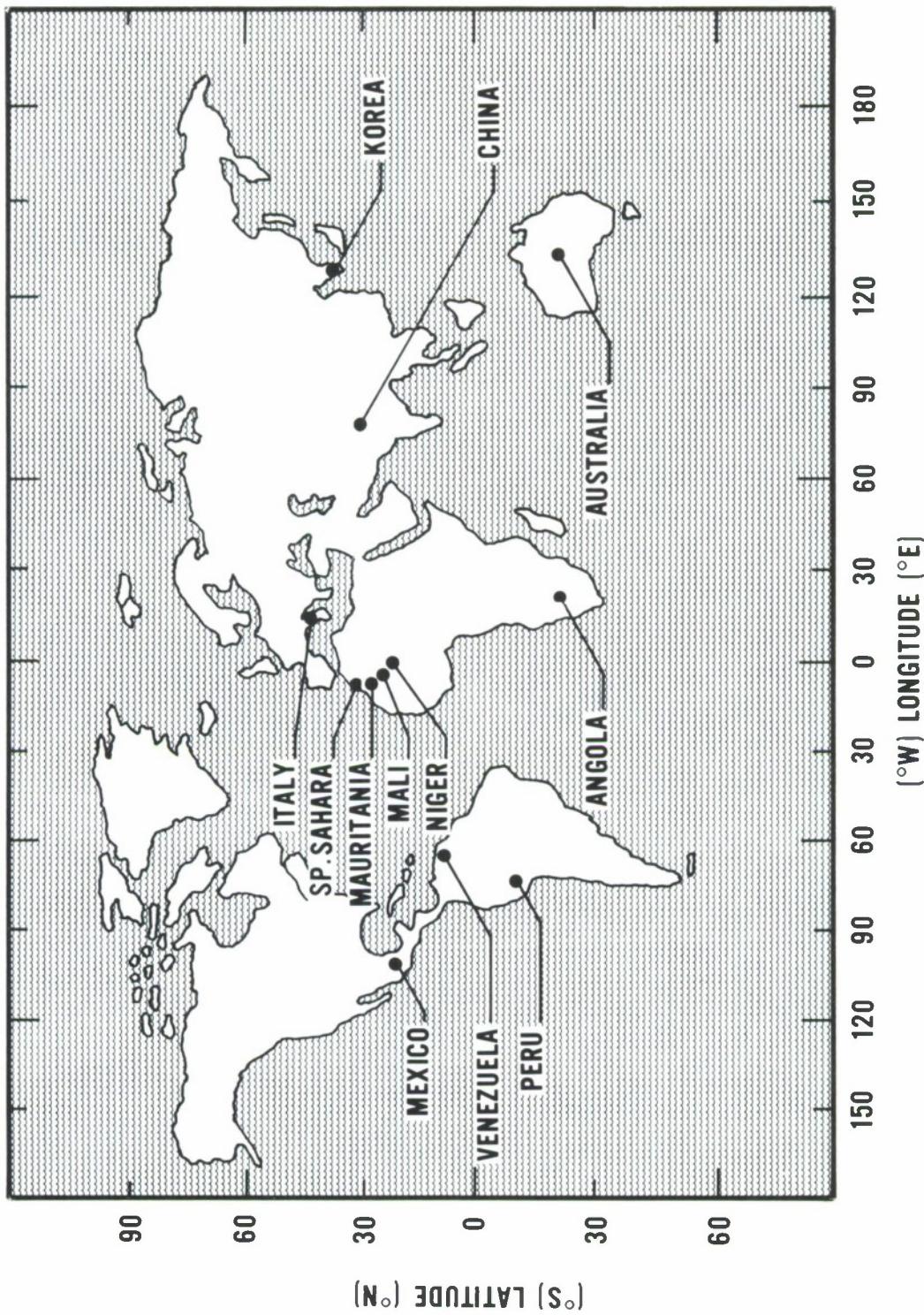


Figure 1. Part IV countries with at least one station experiencing visibility restrictions by airborne dust at least 3.7 days per year.

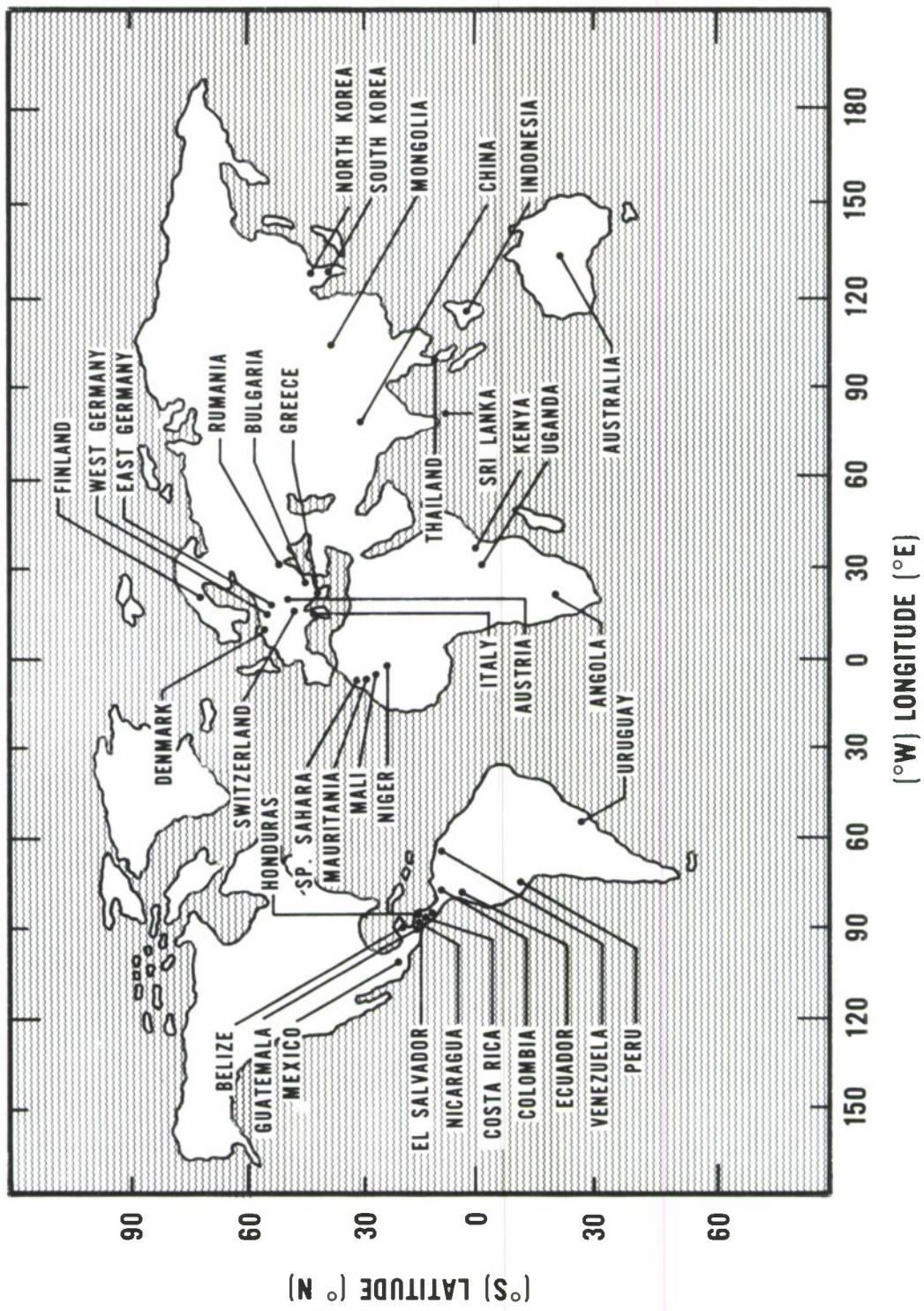


Figure 2. Part IV countries with at least one station experiencing visibility restrictions by airborne dust less than 3.7 days per year.

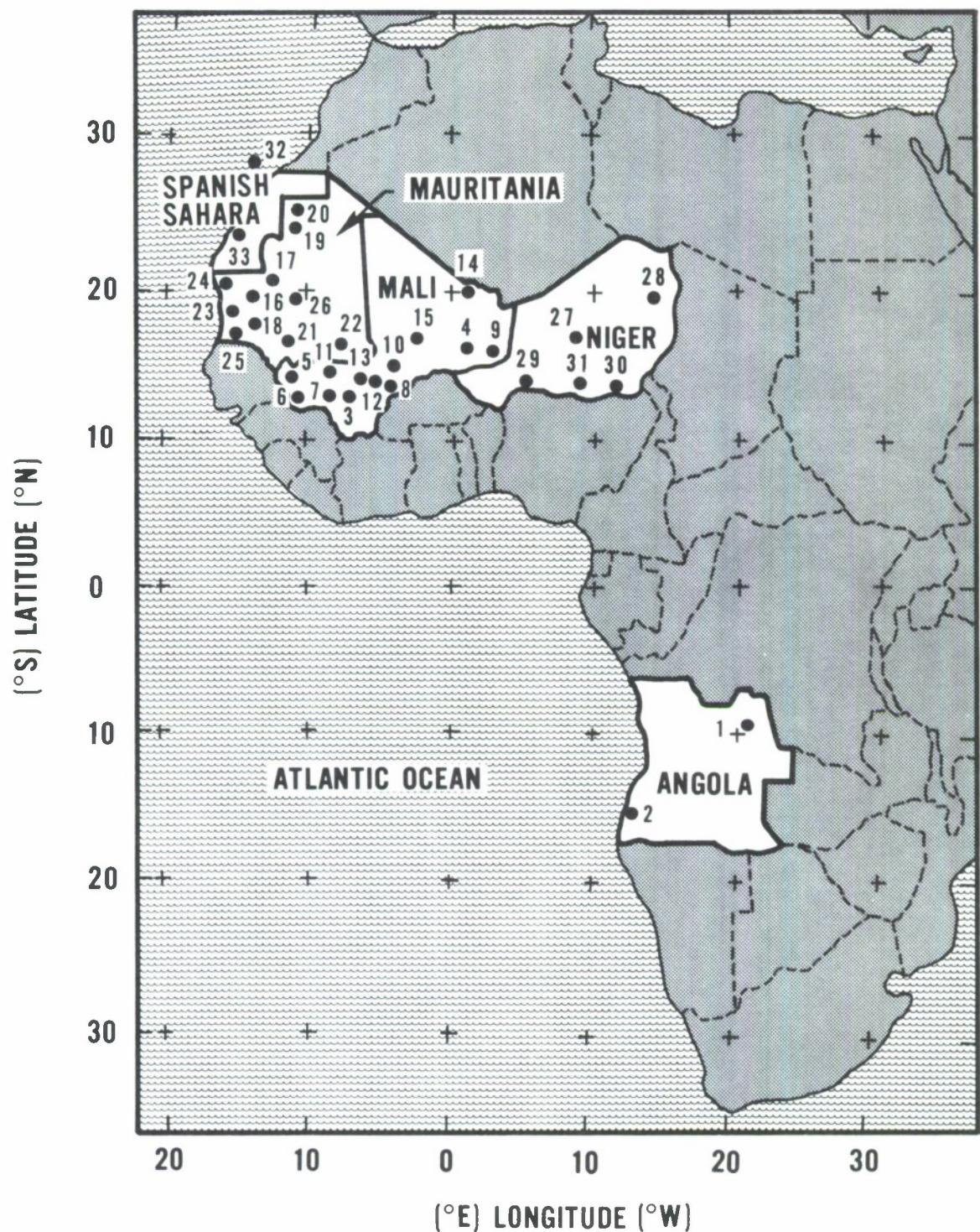


Figure 3. Station coverage for Africa-Angola, Mali, Mauritania, Niger, and Spanish Sahara. (See Table 1 for station summary.)

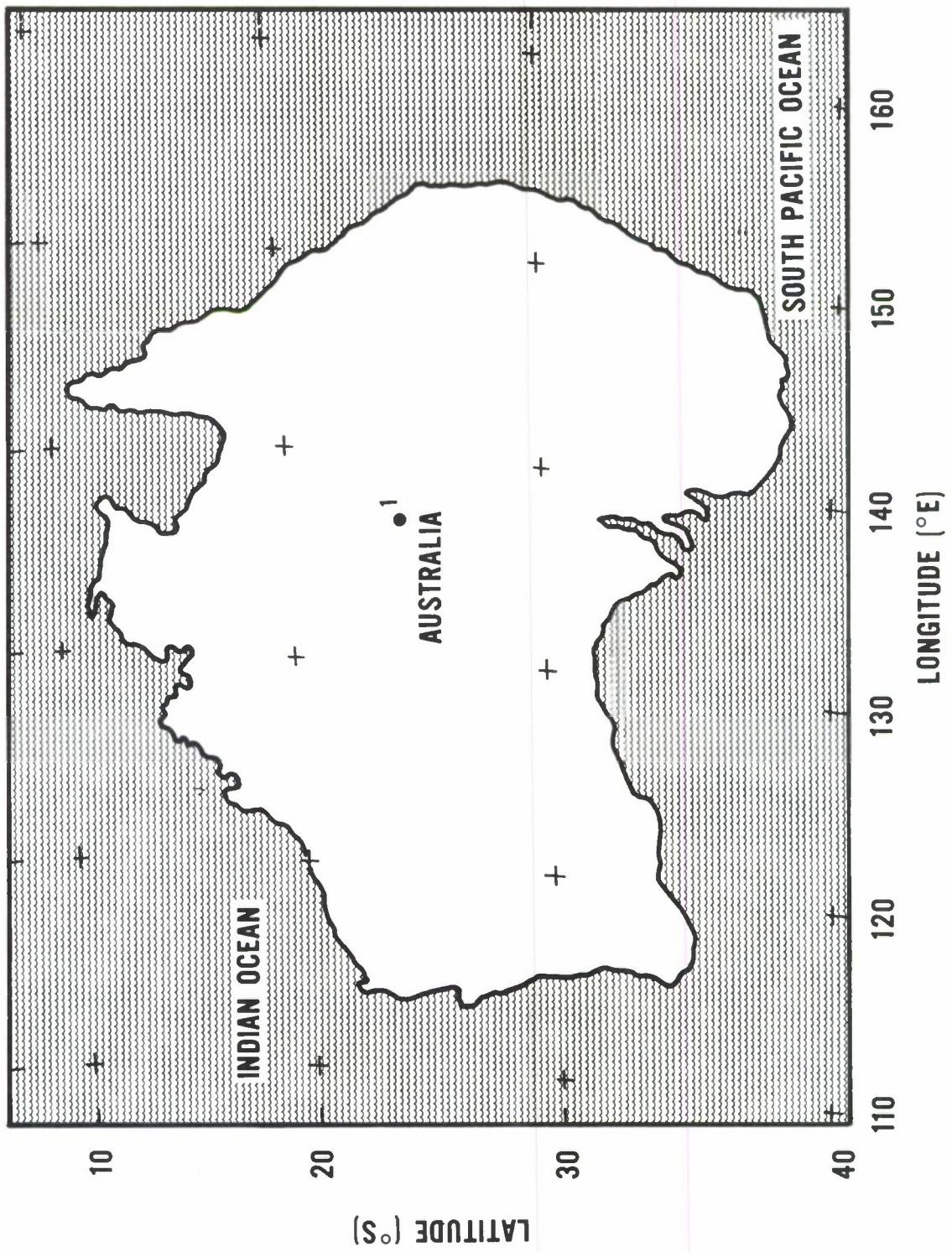


Figure 4. Station coverage for Australia. (See Table 2 for station summary.)

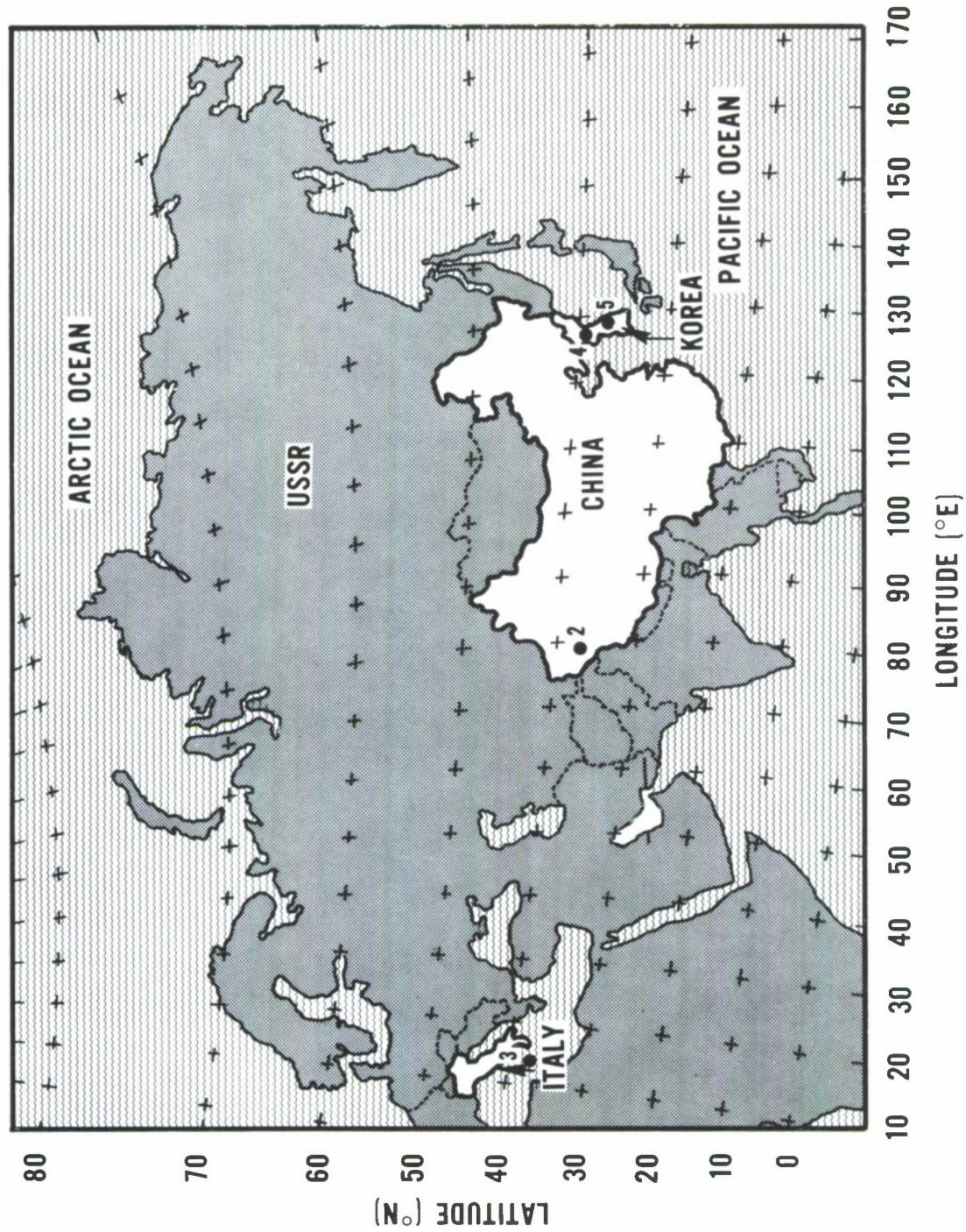


Figure 5. Station coverage for China, Italy, Korea. (See Table 2 for station summary.)

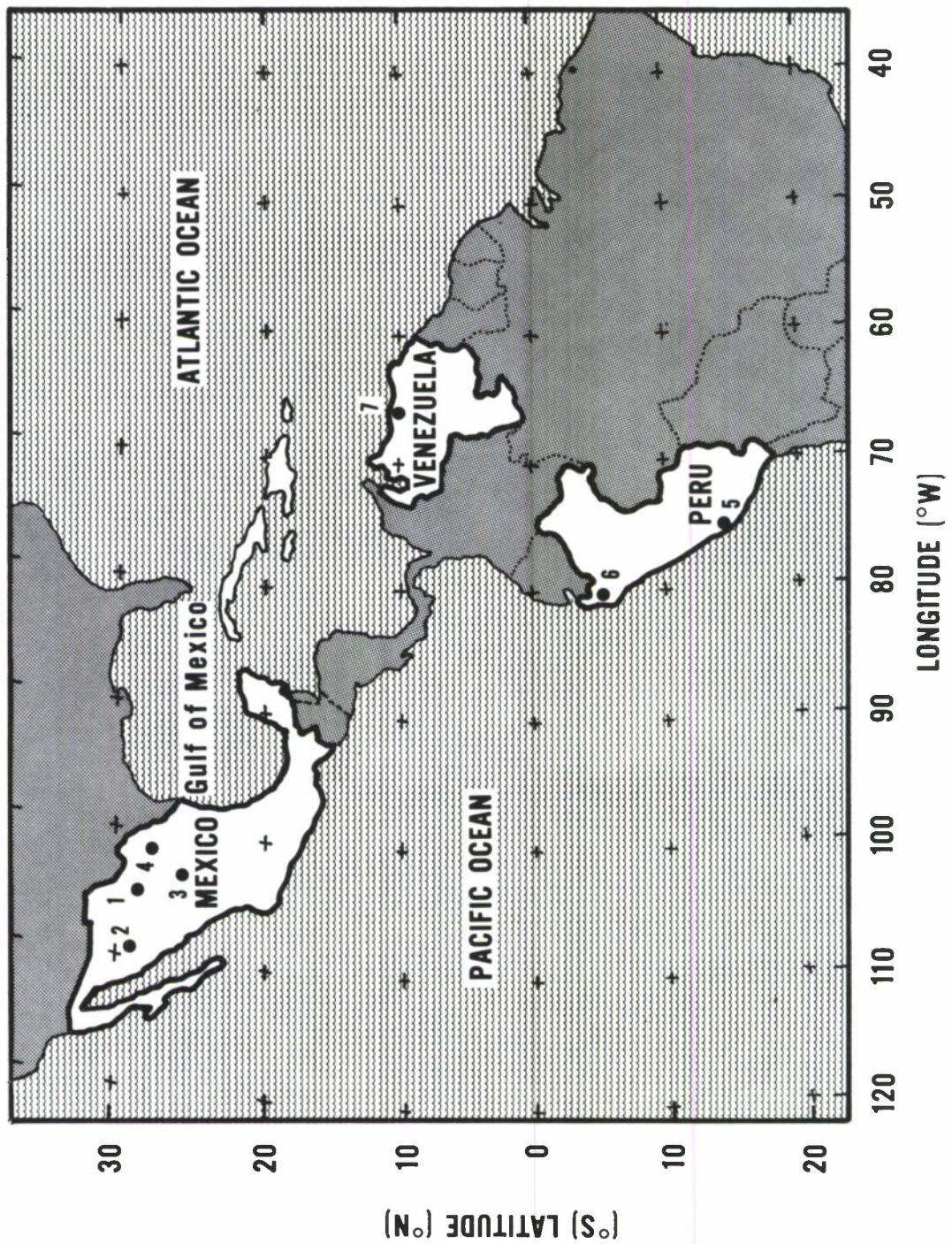


Figure 6. Station coverage for Americas-Mexico, Peru, Venezuela. (See Table 3 for station summary.)

TABLE 1
AFRICA (ANGOLA, MALI, MAURITANIA, NIGER, SPANISH SAHARA)

STATION SUMMARY

LOCATION	LOCATORS	WIND NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS		
						VISIBILITY		km
	STATION TABLE	NO.				V < 11	v < 1 km	
<u>Angola</u>	FIGURE 3							
Henrique De Carvalho	1	5	66226	09°42' S	20°26' E	1092	5.7	0
Mocamedes	2	6	66422	15°12' S	12°09' E	45	4.0	0.1
<u>Mali</u>	FIGURE 3							
Bamako	3	7	61290	12°38' N	08°02' W	329	30.7	0.1
Gao	4	8	61226	16°16' N	00°03' W	260	45.2	2.2
Kayes	5	9	61257	14°26' N	11°26' W	47	27.1	0.2
Kenieba*	6	10	61285	12°48' N	11°21' W	135	5.0	0
Kita*	7	11	61270	13°04' N	09°27' W	337	11.7	0.4
Koutiala*	8	12	61293	12°24' N	05°28' W	346	7.6	0
Menaka*	9	13	61250	15°22' N	02°13' E	278	15.4	1.1
Mopti	10	14	61265	14°31' N	04°06' W	272	21.3	0.7
Nioro Du Sahel*	11	15	61230	15°14' N	09°22' W	237	8.4	0.1
San*	12	16	61277	13°20' N	04°50' W	284	11.0	0.2
Segou*	13	17	61272	13°24' N	06°09' W	289	11.7	0.3
Tessalit*	14	18	61202	20°12' N	00°59' E	496	34.8	4.3
Tombouctou*	15	19	61223	16°43' N	03°00' W	263	16.7	0.9
<u>Mauritania</u>	FIGURE 3							
Akjoujt*	16	20	61437	19°45' N	14°22' W	120	29.9	2.6
Atar	17	21	61421	20°31' N	13°04' W	224	47.4	2.8
Boutilimit*	18	22	61461	17°32' N	14°41' W	75	27.9	2.0

Table 1 (cont)

LOCATION	LOCATORS	STATION TABLE NO.	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS VISIBILITY v < 11 km v < 1 km
<u>Mauritania FIGURE 3</u>							
Fort Gouraud*	19	23	61403	22°41' N	12°42' W	298	17.9 1.0
Fort Trinquet*	20	24	61401	25°14' N	11°37' W	298	15.2 1.9
Kiffa*	21	25	61498	16°38' N	11°24' W	115	22.0 2.1
Nema*	22	26	61219	16°36' N	07°16' W	272	26.9 0.2
Nouakchott	23	27	61442	18°07' N	15°56' W	2	28.9 2.9
Port Etienne	24	28	61415	20°56' N	17°03' W	9	92.3 4.1
Rosso*	25	29	61489	16°30' N	15°49' W	7	19.2 0.7
Tidjika	26	30	61450	18°33' N	11°25' W	401	27.0 1.0
<u>Niger FIGURE 3</u>							
Agadez	27	31	61024	16°59' N	07°59' E	500	13.9 5.3
Bilma*	28	32	61017	18°41' N	12°55' E	357	19.1 2.9
Birni N'Konni	29	33	61075	13°48' N	05°15' E	274	4.7 0.5
Maine-Soroa*	30	34	61096	13°14' N	11°59' E	339	5.2 2.3
Zinder	31	35	61090	13°47' N	08°59' E	453	6.2 1.8
<u>Spanish Sahara FIGURE 3</u>							
Las Palmas (Canary Is.)	32	36	60030	27°56' N	15°23' W	25	6.1 0.3
Villa Cisneros	33	37	60096	23°43' N	15°56' W	10	44.3 2.0

*6/7 Observations per day

TABLE 2

GLOBAL EAST (AUSTRALIA, CHINA, ITALY, KOREA)
STATION SUMMARY

LOCATION	LOCATORS STATION TABLE NO.	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS VISIBILITY $v < 1 \text{ km}$	
						$v < 1 \text{ km}$	$v < 1 \text{ km}$
<u>Australia</u>							
Alice Springs	FIGURE 4	1	38	94326	23°48' S	133°53' E	546
China	FIGURE 5	2	39	51828	37°07' N	79°55' E	1389
Italy	FIGURE 5	3	40	16597	35°51' N	14°29' E	80
Korea	FIGURE 5	4	41	47041	39°54' N	127°31' E	34
		5	42	47118	37°27' N	127°58' E	101
<u>Hamhung, North</u>							
<u>Hoengsong, South</u>							
						3.8	0.1
						4.7	0

TABLE 3

AMERICAS (MEXICO, PERU, VENEZUELA)

STATION SUMMARY

LOCATION	LOCATORS	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS		
						STATION TABLE NO.	NO.	VISIBILITY v < 1 km
Mexico								
Chihuahua	FIGURE 6	1	43	76225	28°38' N	106°05' W	1423	19.7
Hermosillo		2	44	76160	29°02' N	110°58' W	211	5.5
Monclova		3	45	76342	26°54' N	101°25' W	586	34.0
Torreón		4	46	76382	15°34' N	103°25' W	1150	85.1
Peru								
Lima/Callao*	FIGURE 6	5	47	84628	12°00' S	77°07' W	12	3.9
Talara		6	48	84390	04°34' S	81°15' W	86	3.8
Venezuela								
Caracas	FIGURE 6	7	49	80416	10°30' N	66°53' W	835	4.2
*6/7 Observations per day								

TABLE 4

STATIONS AVERAGING LESS THAN 3.7 DAYS PER YEAR (1%) WITH BLOWING DUST (INCLUDING THOSE WITH LESS THAN 5 YEARS OF RECORD)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V < 11 km	ANNUAL VISIBILITY v < 1 km
<u>ANGOLA</u>							
Ambrizete	63-68	66130	07°15' S	12°53' E	19	0	0
Cela	61-68	66270	11°23' S	15°08' E	1308	0	0
Lobito	49-68	66305	12°22' S	13°32' E	3	0	0
Luso	49-68	66285	11°47' S	19°55' E	1326	2.2	0.1
Malanje	50-68	66125	09°33' S	16°22' E	1142	0.6	0
Mavinga	49-68	66447	15°50' S	20°21' E	1088	0.2	0
Nova Lisboa	49-68	66318	12°48' S	15°45' E	1702	0.1	0
Porto Amboim	53-68	66240	10°42' S	13°45' E	5	0	0
Serpa Pinto	53-68	66410	14°39' S	17°41' E	1343	0.5	0
<u>AUSTRALIA</u>							
Forrest	48-57	94646	30°50' S	128°06' E	157	2.6	0.7
Kalgoorlie	48-57	94637	30°46' S	121°27' E	361	1.0	0.1
Meekatharra	48-58	94430	26°36' S	118°33' E	518	0.3	0
Perth	48-69	94610	31°56' S	115°51' E	60	0.2	0.6
Woomera	49-69	94659	31°09' S	136°48' E	166	3.2	0.6
<u>AUSTRIA</u>							
Graz	52-69	11240	47°00' N	15°27' E	342	0.1	0
Innsbruck	52-69	11120	47°16' N	11°21' E	598	0	0
Klagenfurt	52-69	11231	46°39' N	14°21' E	452	0.1	0
Lienz	65-69	11204	46°50' N	12°47' E	676	0.5	0
Linz	52-69	11210	48°14' N	14°11' E	301	0	0
Salsburg	52-69	11150	47°48' N	13°00' E	446	0.1	0
Vienna	52-69	11035	48°15' N	16°22' E	212	0.1	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS v < 11 km v < 1 km
BELIZE (formerly British Honduras)						
Belize	51-66	78584	17°31' N	88°12' W	1	0.2 0
BULGARIA						
Burgas	53-67	15655	42°29' N	27°29' E	28	0.9 0.2
Chermi Vrah	54-67	15613	42°34' N	23°17' E	2295	0.1 0.1
Kolarovgrad	65-67	15544	43°16' N	26°56' E	198	0 0
Kyustendil	66-67	15601	42°16' N	22°46' E	552	0 0
Lom	52-67	15511	43°49' N	23°14' E	33	0.4 0
Pleven	53-67	15526	43°25' N	24°36' E	75	1.1 0.2
Plovdiv	58-67	15625	42°08' N	24°48' E	160	0.9 0
Ruse	53-67	15535	43°52' N	25°58' E	46	1.0 0.2
Sandanski	52-67	15712	41°34' N	23°17' E	191	0.1 0
Siliven	53-67	15640	42°41' N	26°16' E	226	0.3 0.1
Smolyan	53-67	15725	41°37' N	24°41' E	1180	0 0
Sofiya	52-67	15614	42°49' N	23°23' E	588	0.1 0.1
Varna	52-67	15552	43°12' N	27°55' E	41	0.4 0.3
CHINA						
Hua-Tien	57-64	54273	42°58' N	126°43' E	267	0 0
COLOMBIA						
Barranquilla/Soledad	49-70	80028	10°53' N	74°47' W	21	0.1 0
Bogota/El Dorado	50-70	80222	04°42' N	74°09' W	2547	0 0
Girardot	63-70	80219	04°16' N	74°49' W	293	0 0
San Marcos	49-70	80070	08°39' N	75°10' W	46	0.1 0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS		
						VISIBILITY v <1 km	v <1 km	v <1 km
COSTA RICA								
Puerto Limon	49-56	78767	09°58' N	83°01' W			0.3	0
San Jose/El Coco	55-60	78762	09°59' N	84°13' W	939		0	0
San Jose/La Sabana	49-55	78763	09°57' N	84°05' W	1141		0	0
DENMARK								
Blavand	53-70	06081	55°33' N	08°05' E		12	0.2	0
Copenhagen/Kastrup	49-71	06180	55°38' N	12°40' E		5	0.4	0
Dueodde	53-71	06199	55°00' N	15°05' E		6	0.2	0
Fornaes	53-71	06071	56°27' N	10°58' E		8	0.5	0.2
Karup	53-71	06060	56°17' N	09°08' E		52	0.8	0
Odense/Beldringe	54-71	06120	55°28' N	10°20' E		17	0.4	0
Skagen	53-71	06041	57°46' N	10°39' E		3	0	0
Thorshaven(Faroe Is.)	53-71	06011	62°03' N	06°45' W		24	0.1	0
EAST GERMANY								
Berlin/Tempelhof	59-71	10384	52°28' N	13°26' E		50	0.2	0
Fichtelberg	52-71	10578	50°26' N	12°57' E		1215	0.1	0
Gorlitz	52-71	10499	51°10' N	14°57' E		238	0.1	0
Kaltennordheim	52-71	10546	50°39' N	10°09' E		494	0	0
Leipzig/Mockau	52-71	10470	51°24' N	12°24' E		137	0.1	0
Magdeburg	52-71	10361	52°06' N	11°35' E		85	0	0
Ueckermunde	52-71	10193	53°45' N	14°04' E		1	0.1	0
Wittenberge	52-71	10262	53°02' N	11°48' E		24	0	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS	
						V < 1 km	v < 1 km
ECUADOR							
Guayaquil/Simon Bolívar	49-68	84129	02°12' S	79°53' W	4	0	0
Puyo	65-67	84154	01°29' S	77°39' W	950	0.3	0
Riobamba	64-67	84130	01°38' S	78°38' W	2754	0	0
San Lorenzo	65-67	84036	01°16' N	78°54' W	4	0	0
EL SALVADOR							
San Salvador/Ilopango	51-66	78663	13°42' N	89°11' W	679	0	0
FINLAND							
Helsinki	52-63	02974	60°19' N	24°58' E	58	0.2	0
Luonetjärvi	52-63	02935	62°24' N	25°40' E	142	0.1	0
Sodankylä	52-63	02836	67°22' N	26°39' E	180	0	0
GREECE							
Alexandroupolis	60-70	16627	40°51' N	25°57' E	4	0	0
Athens	49-70	16716	39°54' N	23°44' E	9	1.2	0.1
Florina	60-70	16613	40°48' N	21°25' E	651	0.3	0
Ioannina	60-70	16642	39°40' N	20°49' E	484	0	0
Iraklion (Crete)	49-70	16754	35°19' N	25°15' E	13	0.4	0
Kerkira	57-70	16641	39°37' N	19°55' E	2	0.5	0
Khania (Crete)	60-69	16747	35°30' N	24°02' E	63	0	0
Khios	60-70	16704	38°22' N	26°09' E	61	1.2	0
Kimi	64-70	16683	38°38' N	24°06' E	218	0	0
Larisa	57-70	16648	39°38' N	22°25' E	74	0.5	0.1
Levkas	60-70	16669	38°50' N	20°43' E	6	0	0
Limnos	60-70	16651	39°53' N	25°15' E	17	0	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS VISIBILITY v < 11 km v < 1 km
GREECE (cont)						
Methoni	57-70	16734	36°50' N	21°43' E	34	0 0
Naxos	60-70	16732	37°06' N	25°24' E	9	0.2 0
Samos	60-70	16721	37°45' N	26°52' E	49	0 0
Thessaloniki	60-70	16622	40°31' N	22°53' E	7	0.6 0
Timbakion	65-70	16759	35°00' N	24°45' E	6	0.4 0
Zakinthos	60-70	16705	37°47' N	20°53' E	4	0 0
GUATEMALA						
Guatemala City	51-68	78641	14°35' N	90°32' W	1494	0 0
HONDURAS						
Amapala	57-68	78700	13°17' N	87°38' W	5	0 0
Catacamas	57-67	78714	14°54' N	85°56' W	412	0 0
Guanaja	57-68	78701	16°28' N	85°55' W	2	0.2 0
Santa Rosa de Copan	57-68	78717	14°47' N	88°48' W	06	0.2 0
Tegucigalpa	51-68	78720	14°04' N	87°13' W	1007	0 0
Tela	51-68	78706	15°43' N	87°29' W	3	0.1 0
INDONESIA						
Amboina	56-65	97724	03°42' S	128°05' E	12	0.1 0
Bandjermasin/Ulin	49-65	966685	03°27' S	114°45' E	20	0.3 0
Makasar/Hassanuddin	49-65	97180	05°04' S	119°33' E	14	0.1 0
Medan	49-65	96035	03°34' N	98°41' E	25	0.4 0
Surabaja/Perak	49-64	96933	07°13' S	112°43' E	3	0.5 0.1

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V <1 km v <1 km
ITALY						
Amendola	65-70	16261	41°32' N	15°43' E	56	0.2
Bari/Palese Macchie	65-70	16270	41°08' N	16°47' E	49	0
Bolzano	65-70	16020	46°28' N	11°19' E	237	0
Bonifati	65-70	16337	39°35' N	15°54' E	485	0.4
Brindisi	52-70	16320	40°39' N	17°57' E	10	0
Cagliari/Elmas (Sardinia)	52-70	16560	39°15' N	09°03' E	18	0.6
Campobasso	65-70	16252	41°33' N	14°39' E	807	0
Catania/Sigonella (Sicily)	60-68	16459	37°34' N	14°55' E	31	0.2
Cozzo Spadaro(Sicily)	66-70	16480	36°41' N	15°08' E	46	0.6
Crotone	57-70	16350	39°00' N	17°05' E	158	0.1
Lampedusa	66-70	16490	35°30' N	12°36' E	23	0
Messina(Sicily)	49-70	16420	38°12' N	15°33' E	51	0.1
Milano/Linate	52-70	16080	45°26' N	09°17' E	103	0.3
Oristano/Capo della Frasca(Sardinia)	66-70	16539	39°45' N	08°28' E	91	0.2
Palermo/Punta Raisi(Sicily)	65-70	16405	38°11' N	13°05' E	17	0.5
Pantelleria	57-70	16470	36°49' N	11°57' E	170	0
Passo Resia	67-70	16008	46°50' N	10°31' E	1521	0
Pisa/San Giusto	56-70	16158	43°41' N	10°23' E	1	0.1
Potenza	65-70	16300	40°38' N	15°48' E	842	0.2
Trapani/Birgi(Sicily)	65-70	16429	37°55' N	12°30' E	14	0
Venezia/San Nicolo	52-60	16100	45°26' N	12°23' E	4	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS v < 11 km	ANNUAL NO. OF DAYS v < 1 km
<u>KENYA</u>							
Kisumu	63-66	63708	00°06' S	34°45' E	1146	0.3	0
Mombasa	63-66	63820	04°02' S	39°37' E	55	0	0
Nairobi	63-66	63740	01°19' S	36°55' E	1624	0.9	0.3
<u>MALI</u>							
Bougouni	49-67	61296	11°25' N	07°30' W	352	3.2	0
Hombori	49-67	61240	15°20' N	01°41' W	288	3.4	0
Sikasso	49-67	61297	11°21' N	05°41' W	375	1.9	0
<u>MONGOLIA</u>							
Choybalsan	57-63	44259	48°04' N	114°30' E	756	1.7	0.3
Saynshand	57-63	44354	44°53' N	110°10' E	912	3.3	0.9
Ulan Bator	57-63	44292	47°51' N	106°45' E	1267	1.9	0.1
<u>NICARAGUA</u>							
Managua	56-62	78741	12°07' N	86°11' W	56	0	0
<u>NIGER</u>							
Maradi	49-67	61080	13°28' N	07°05' E	369	3.5	0.3
Nguigmi	50-67	61049	14°15' N	13°07' E	286	3.3	0.8
Niamey	49-67	61052	13°29' N	02°10' E	234	3.6	0.2

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V < 11 km v < 1 km
<u>NORTH KOREA</u>						
Chongjin	59-71	47008	41°47' N	129°49' E	90	2.9
Chungganjin	59-71	47014	41°47' N	126°53' E	312	0.5
Haeju	59-71	47069	38°02' N	125°42' E	81	1.2
Hesan	59-71	47016	41°24' N	128°13' E	998	0.7
Kange	59-71	47020	40°48' N	126°36' E	305	1.2
Kimchaek	59-71	47025	40°41' N	129°13' E	72	0.2
Pyongyang	59-71	47058	39°01' N	125°49' E	29	3.5
Sariwon	60-71	47065	38°31' N	125°46' E	24	2.3
Sinuiju	59-71	47035	40°06' N	124°23' E	8	2.4
Ungg	59-71	47003	42°19' N	130°24' E	89	0.2
Wonsan	59-71	47055	39°11' N	127°26' E	36	0.7
<u>PERU</u>						
Chiclayo	49-69	84452	06°47' S	79°50' W	37	0.1
Pisco	49-69	84691	13°45' S	76°17' W	7	2.6
Piura	57-69	84401	05°11' S	80°36' W	55	2.2
San Juan	57-69	84721	15°23' S	75°10' W	31	0.4
<u>RUMANIA</u>						
Bacau	52-67	15150	46°35' N	26°59' E	182	1.1
Birlad	66-67	15197	46°14' N	27°40' E	173	0.5
Botosani	58-67	15020	47°45' N	26°40' E	172	0.6
Bucharest	52-67	15420	44°29' N	26°08' E	92	0.3

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V < 1 km v < 1 km
RUMANIA (cont)						
Calarasi	65-67	15460	44°12'	27°21' E	20	0.3
Cluj	52-67	15120	46°47'	23°34' E	410	0.4
Constanta	52-67	15480	44°13'	28°38' E	32	0.9
Galati	52-67	15310	45°30'	28°01' E	74	0.3
Lasi	52-67	15090	47°10'	27°35' E	104	1.5
Oraden	52-67	15080	47°03'	21°56' E	135	0.1
Pitesti	66-67	15373	44°52'	24°52' E	307	0
Satu Mare	52-67	15010	47°48'	22°53' E	123	0.3
Sibiu	52-67	15260	45°48'	24°09' E	452	0
Sulina	52-67	15360	45°09'	29°40' E	3	0.5
Timisoara	52-67	15247	45°46'	21°15' E	90	0.9
Tirgu Mures	52-67	15145	46°32'	24°32' E	308	0
Turnu Magurele	52-67	15490	43°45'	24°52' E	31	0.5
Turnu Severin	52-67	15410	44°38'	22°38' E	70	0.3
Vrf Omu	52-67	15280	45°27'	25°27' E	2508	0.4
SOUTH KOREA						
Kangnung	51-66	47107	37°45'	128°57' E	6	1.5
Kansong	53-54	47071	38°24'	128°36' E	UNK	0.1
Kunsan	51-65	47141	35°54'	126°37' E	15	2.0
Kwandaë Ri	52-66	47066	38°01'	128°07' E	180	2.1
Kwangju	54-66	47158	35°07'	126°49' E	13	0.7
Osan	53-66	47122	37°06'	127°02' E	15	0.9
Paengnyong Do	52-66	47103	37°58'	124°40' E	177	2.4
Pohang	58-65	47139	35°59'	129°25' E	20	0.1

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V < 11 km	ANNUAL NO. OF DAYS V < 1 km
<u>SOUTH KOREA (cont)</u>							
Pusan East	51-62	47154	35°10' N	129°08' E	5	1.4	0
Sachon	54-66	47161	35°05' N	128°05' E	8	0.7	0
Seoul Kimpo	46-66	47111	37°31' N	126°55' E	10	1.5	0
Taegu	51-66	47142	35°54' N	128°39' E	35	2.4	0.1
Taejon	51-66	47132	36°21' N	127°24' E	40	0.6	0
Tongouchou	53-66	47106	37°55' N	127°03' E	60	0.5	0
<u>SPANISH SAHARA</u>							
Los Rodeos (Canary Is)	50-67	60015	28°29' N	16°20' W	641	1.6	0.1
<u>SRI LANKA (formerly Ceylon)</u>							
Batticaloa	57-71	43436	07°43' N	81°42' E	12	0.2	0
Colombo	56-68	43466	06°54' N	79°52' E	6	0.1	0
Hambantota	56-71	43497	06°07' N	81°08' E	20	0	0
Kankesanturai	56-71	43400	09°48' N	80°04' E	10	0	0
Puttalam	59-71	43424	08°02' N	79°50' E	2	0.1	0
<u>SWITZERLAND</u>							
Geneva/Cointrin	55-69	06700	46°14' N	06°06' E	430	0.1	0
Locarno	55-69	06762	46°10' N	08°53' E	198	0.1	0
Sion	55-69	06720	46°13' N	07°20' E	481	0.1	0
Zurich/Kloten	55-69	06670	47°29' N	08°32' E	431	0	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS v < 1 km	ANNUAL VISIBILITY v < 1 km
THAILAND							
Aranayaprathe	49-65	48462	13°42'	102°35' E	44	0	0.1
Ban Don	49-65	48551	09°08'	99°18' E	3	0.4	0.1
Bangkok	49-65	48455	13°44'	100°30' E	12	0.1	0
Ban Mae Sariang	54-65	48325	18°10'	97°50' E	314	0.1	0
Chanthaburi	49-65	48480	12°37'	102°07' E	5	0.3	0.1
Chiang Mai	54-65	48327	18°47'	98°59' E	313	0.1	0
Chiang Rai	56-65	48303	19°55'	99°50' E	416	0.7	0
Chumphon	49-65	48517	10°27'	99°15' E	3	0.7	0.1
Hua Hin	49-65	48475	12°34'	99°48' E	3	0.3	0.1
Kanchanaburi	49-65	48450	14°01'	99°32' E	28	0.2	0
Khlong Yai	50-65	48501	11°47'	102°53' E	4	0.3	0
Khon Kaen	49-65	48381	16°20'	102°51' E	157	0.3	0
Loei	54-65	48353	17°27'	101°44' E	248	0.3	0
Lop Buri	49-65	48426	14°48'	100°37' E	13	0.1	0
Mae Hong Son	54-65	48300	19°18'	97°50' E	271	0.2	0
Mae Sot	49-65	48375	16°40'	98°33' E	210	0.3	0
Mukdahan	49-65	48383	16°33'	104°44' E	138	0.6	0
Nakhon Phanom	52-65	48357	17°22'	104°39' E	140	0.3	0
Nakhon Rat Sima	49-65	48431	14°58'	102°07' E	181	0.4	0
Nakhon Sawan	49-65	48400	15°48'	100°10' E	28	0.3	0
Nan	49-65	48331	18°47'	100°47' E	201	0.4	0
Narathiwat	49-65	48583	06°26'	101°50' E	4	0.1	0
Phetchabun	50-65	48379	16°25'	101°08' E	114	0.2	0
Phitsanulok	49-65	48378	16°50'	100°16' E	50	0.3	0
Phuket	56-65	48565	08°08'	98°19' E	3	0	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS v < 1 km v < 1 km
<u>THAILAND (cont)</u>						
Prachuap	49-65	48500	11°48' N	99°48' E	5	0.4 0
Ramong	54-65	48532	09°58' N	98°38' E	35	0 0
Roi Et	49-65	48405	16°03' N	103°41' E	140	0.5 0
Sakon Nakhon	49-65	48356	17°10' N	104°09' E	160	0.5 0
Sattahip	49-61	48477	12°39' N	100°53' E	55	0.4 0
Songkhla	49-65	48568	07°11' N	100°37' E	4	2.2 0.1
Surin	49-65	48432	14°53' N	103°29' E	145	0.1 0
Trang	62-65	48567	07°30' N	99°40' E	12	0 0
Ubon Ratchathani	49-65	48407	15°15' N	104°52' E	127	0.5 0
Udon Thani	43-65	48354	17°22' N	102°46' E	178	0.2 0
<u>UGANDA</u>						
Entebbe	63-66	63705	00°03' N	32°27' E	1146	0 0
Guju	57-66	63630	02°49' N	32°16' E	1070	0 0
<u>URUGUAY</u>						
Montevideo/Carrasco	49-68	86580	34°50' S	56°02' W	29	0.1 0
Salto	49-68	86360	31°23' S	57°58' W	46	0 0
<u>VENEZUELA</u>						
Barcelona	59-70	80419	10°07' N	64°41' W	9	0 0
Ciudad Bolivar	50-70	80444	08°09' N	63°33' W	55	0.2 0
Coro	50-70	80403	11°25' N	69°41' W	21	0.1 0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS V < 1 km	ANNUAL NO. OF DAYS V < 1 km
<u>VENEZUELA (cont)</u>							
Guiria	50-70	80423	10°35' N	62°18' W	8	0	0
La Orchila	59-70	80405	11°48' N	66°11' W	3	0	0
Maracaibo	50-70	80407	10°39' N	71°36' W	48	1.3	0
Maracay	50-70	80413	10°15' N	67°39' W	443	0	0
Puerto Ayacucho	59-70	80457	05°36' N	67°30' W	100	0	0
San Antonio	50-70	80447	07°51' N	72°27' W	405	0	0
San Fernando	50-70	80450	07°54' N	67°25' W	74	0	0
Santa Elena	50-70	80462	04°36' N	61°07' W	907	0.1	0
<u>WEST GERMANY</u>							
Augsburg	49-71	10852	48°23' N	10°51' E	499	0	0
Bremen	60-71	10224	53°03' N	08°47' E	3	0.1	0
Bremervhaven	49-71	10129	53°32' N	08°35' E	10	0	0
Emden	60-71	10203	53°20' N	07°12' E	6	0	0
Frankfurt/Ming	55-71	10637	50°03' N	08°35' E	112	0.1	0
Friedrichshafen	60-71	10934	47°39' N	09°29' E	407	0.1	0
Hamburg	49-71	10147	53°38' N	10°00' E	16	0.2	0
Hof	60-71	10685	50°19' N	11°53' E	568	0	0
Kassel	49-71	10438	51°19' N	09°29' E	158	0	0
Munich	49-71	10866	48°08' N	11°42' E	528	0.1	0
Münster	60-71	10313	51°58' N	07°36' E	66	0.1	0
Nürnberg	60-71	10763	49°30' N	11°05' E	318	0.1	0

Table 4 (cont)

LOCATION	PERIOD OF RECORD (yr)	WMO NO.	LATITUDE	LONGITUDE	ELEV (m)	ANNUAL NO. OF DAYS v < 11 km	ANNUAL VISIBILITY v < 1 km
WEST GERMANY (cont)							
P 8 Ship	60-71	10004	54°16' N	07°12' E	3	0	0
Regensburg	49-71	10776	49°01' N	12°04' E	377	0	0
Saarbrücken	60-71	10708	49°13' N	07°07' E	323	0.1	0
Schleswig	60-71	10035	54°32' N	09°33' E	48	0.3	0
Trier	49-71	10609	49°45' N	06°40' E	274	0.1	0
Würzburg	49-71	10655	49°48' N	09°54' E	259	0.1	0
Zugspitze	49-71	10961	47°25' N	10°59' E	2962	0.1	0

TABLE 5
OCCURRENCE OF DUST - HENRIQUE DE CARVALHO, ANGOLA (Jun 52 - Dec 68)

FIGURE 3 STATION 1

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility < 1 km)													
N = 0													
01													1
04													3
07													6
10													9
13													12
16													24
19													
22													
NONE REPORTED													
BLLOWING DUST (visibility < 11 km)													
N = 10													
01													1
04													1.00
07													3
10													0.57
13													0.25
16													0.11
19													0.05
22													
Avg	*	*	*	2	2	3	*	*	*	*	*		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting from a certain period of time and specified hour and month equals duration factor times diurnal variation by month.

TABLE 6

OCCURRENCE OF DUST - MOCAMEDES, ANGOLA (Jan 49 - Dec 68)

FIGURE 3 STATION 2

$N = \text{Arithmetic mean of the annual number of occurrences of dust equal to or greater than } 1\text{-hour duration.}$

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 7

OCCURRENCE OF DUST - BAMAKO, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 3

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor				
	J	F	M	A	J	S	N	D	Hours ≥	Decimal Percent	
N = 0.07						DUST STORMS (visibility <1 km)					
02							1		1	1.00	
05							3		3	0.62	
08							*		6	0.33	
11							9		9	0.16	
14							12		12	0.11	
17							24		24	0.02	
20											
23											
Avg						BLOWING DUST (visibility <1 km)					
02	6	5	3	2	*	*	2	7	1	1.00	
05	7	6	2	4	2	1	3	7	3	0.62	
08	15	9	9	5	3	3	8	12	6	0.33	
11	10	11	7	3	1	2	5	7	9	0.16	
14	10	10	6	3	3	1	6	7	12	0.11	
17	11	9	6	3	1	*	1	6	7	0.02	
20	10	9	6	2	1	2	11	13	10		
23	7	7	3	2	1	*	2	8	10		
Avg	10	8	5	3	2	*	3	7			

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likehood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 8

OCCURRENCE OF DUST - GAO, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 4

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor				
	J	F	M	A	J	S	O	N	D	Hours ≥	Decimal Percent
N = 6						DUST STORMS (visibility <1 km)					
00	*	*	*	*	2	2	1	1	1	1	1.00
03	*	*	*	*	2	2	3	3	3	3	0.34
06	*	*	1	*	*	*	6	6	6	6	0.14
09	*	*	1	*	*	*	9	9	9	9	
12	*	*	1	*	*	*	12	12	12	12	
15	*	*	*	*	*	*	24	24	24	24	
18	*	*	*	*	1	*					
21	*	*	*	*	1	*					
N = 47						BLOWING DUST (visibility <11 km)					
00	6	15	14	8	12	10	4	*	3	3	1.00
03	7	16	14	9	12	12	4	1	*	3	3
06	8	14	15	8	12	12	4	1	*	4	0.58
09	9	17	17	9	14	15	5	1	1	5	6
12	11	19	16	7	10	10	5	1	1	5	0.38
15	14	23	19	8	12	13	6	1	1	7	12
18	13	23	16	10	11	15	5	2	2	7	0.27
21	10	21	17	10	11	11	4	1	2	4	24
Avg	10	19	16	8	1	12	5	1	1	5	0.08

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

	1	3	5	6
00	1	3	4	1
03	3	3	5	3
06	6	6	5	6
09	9	9	7	9
12	12	12	7	12
15	15	15	7	12
18	18	18	7	12
21	21	21	6	21

Duration Factor

Hours
≥Decimal
Percent

12

24

24

24

24

24

24

Visibility
Condition

Month

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 9

OCCURRENCE OF DUST - KAYES, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 5

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor				
	J	F	M	A	J	S	0	N	D	Hours ≥	Decimal Percent
<i>N = 0.7</i>											
02	*	*	*	*	*	*	*	*	*	1	1.00
05										3	0.30
08										6	0.10
11										9	
14										12	
17										24	
20											
23											
Avg	*	*	*	*	*	*	*	*	*		
<i>N = 24</i>											
02	5	8	8	5	6	*	6	6	3	1	1.00
05	6	9	6	6	6	*	5	6	3	3	0.78
08	8	11	7	9	6	1	5	5	4	6	0.60
11	9	10	8	8	5	*	4	3	2	9	0.38
14	11	14	8	8	6	*	6	4	2	12	0.30
17	11	11	9	8	7	*	*	10	7	5	24
20	11	10	7	7	7	*	*	10	7	5	0.09
23	6	8	8	6	5		7	5	3		
Avg	8	10	8	7	6	*	*	*	*	6	5

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 10

OCCURRENCE OF DUST - KENIEBA, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 6

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor							
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 0														
02													1	
05													3	
08													6	
11													9	
14													12	
17													24	
20														
23														
Avg													*	3

23

35

DUST STORMS (visibility < 1 km)

N = 0	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
02													3	1.00
05													4	0.75
08													5	0.48
11													9	0.32
14													12	0.16
17														
20														
23														
Avg													*	3

BLOWING DUST (visibility < 11 km)

N = 5	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
02	1	2	3	1	1	1	1						3	1.00
05													4	0.75
08	2	2	4	1	1	2							5	0.48
11	2	1	2	1	1	1							9	0.32
14	3	2	3	1	1	1							12	0.16
17	2	1	1	1	1	1								
20	2	2	2	2	2	2								
23	2	2	2	2	2	1								
Avg													*	3

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likehood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 11

OCCURRENCE OF DUST - KITA, MALI (Jan 57 - Dec 67)

FIGURE 3 STATION 7

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 0.3													
02	1												1.00
05													3
08													6
11													9
14													12
17													24
20													
23													
Avg													*
N = 15													
02	6	2	1	1									1.00
05	4	2	1	*									3
08	3	7	2	1	*								6
11	5	7	3	1	1	*							9
14	6	8	3	2	1								12
17	7	10	2	2	1								24
20	9	9	3	1									0.01
23	7	2	1										
Avg	4	7	2	1	1								

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 12
OCCURRENCE OF DUST - KOUTIALA, MALI (Apr 50 - Dec 67)

FIGURE 3 STATION 8

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 0	DUST STORMS (visibility <1 km)												
00													1
03													3
06													6
09													9
12													12
15													24
18													
21													
Avg													

N = 7
BLOWING DUST (visibility <1 km)

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 7	BLOWING DUST (visibility <1 km)												
00													1
03													3
06													6
09													9
12													12
15													24
18													
21													
Avg													

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 13

OCCURRENCE OF DUST - MENAKA, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 9

Hour (LST)	Diurnal Variation by Month (%)						Dust Storms (visibility < 1 km)	Duration Factor						
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 2														
00													1	1.00
03													3	0.46
06													6	0.21
09													9	0.03
12	*												12	
15								*					24	
18														
21														
Avg														
N = 20														
00	4												1	1.00
03	4												3	0.64
06	4												6	0.36
09	6												9	0.17
12	5												12	0.08
15	5												24	0.01
18	4													
21	7													
Avg														
BLOWING DUST (visibility < 11 km)														
00	4												1	1.00
03	4												3	
06	4												6	
09	6												9	
12	5												12	
15	5												24	
18	4													
21	7													
Avg														

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 14

OCCURRENCE OF DUST - MOPTI, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 10

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 0.9												DUST STORMS (visibility <1 km)		
00	*												1	1.00
03	*	*											3	0.63
06	*	*	*					*					6	0.31
09	*	*	*	*				*					9	0.15
12		1							*				12	0.07
15	1								*				24	
18	*						*			*				
21	*													
39	Avg	*	*	*	*	*	*	*	*	*	*	*		
N = 21												BLOWING DUST (visibility <1 km)		
00	3	4	8	3	3	3	*					1	4	2
03	2	3	8	3	3	3						1	4	2
06	3	4	11	4	3	3	1					2	6	3
09	6	9	12	5	3	2	*					3	7	5
12	6	8	9	4	2	2						2	5	4
15	6	10	10	6	2	2						3	5	5
18	5	7	8	3	2	1	*					1	5	4
21	5	6	8	4	3	1	*					1	4	4
Avg	5	7	9	4	3	3	1	*				2	5	4

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE I5

OCCURRENCE OF DUST - NIRO DU SAHEL, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 11

Hour (LST)	DUST VARIATION BY MONTH (%)					Duration Factor
	J	F	M	A	S	
N = 0.07	02	3	1	1	1	1.00
	05	2	1	1	1	0.72
	08	4	2	3	1	0.44
	11	5	4	3	2	0.26
	14	4	5	3	2	0.13
	17	1	2	4	2	0.01
	20	3	4	6	3	
	23	1	3	3	1	
Avg	2	3	4	2	2	*

Hour (LST)	DUST STORMS (VISIBILITY < 1 km)					Duration Factor
	J	F	M	A	S	
N = 0.07	02	1	1	1	1	1.00
	05	3	1	1	1	0.72
	08	2	1	1	1	0.44
	11	4	2	3	1	0.26
	14	4	5	3	2	0.13
	17	1	2	4	2	0.01
	20	3	4	6	3	
	23	1	3	3	1	
Avg	2	3	4	2	2	*

{ = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

40.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 16

OCCURRENCE OF DUST - SAN, MALI (Jan 50 - Dec 67)

FIGURE 3 STATION 12

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
DUST STORMS (visibility < 1 km)														
00												1	1.00	
03												3	0.39	
06												6	0.19	
09												9		
12							*					12		
15								*						
18									*					
21										*				
BLLOWING DUST (visibility < 11 km)														
00	1	2	6	6	1							1	1.00	
03	1	6	9	1								3	0.71	
06	4	6	10	1	*	1						6	0.43	
09	4	5	8	2	*	*						9	0.26	
12	4	5	6	7	*	*						12	0.13	
15	5	6	7	2	*	1						24	0.02	
18	3	4	5	2			1							
21	2	1	5	4				1						
Avg	3	5	7	2	*	*	*	*	*			1	1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 17

OCCURRENCE OF DUST - SEGOU, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 13

Hour (LST)	Diurnal Variation by Month (%)						DUST STORMS (visibility < 1 km)				Duration Factor		
	J	F	M	A	M	J	A	S	O	N	D	Hours ≥ 24	Decimal Percent
N = 0.3												1	1.00
00												3	1.00
03	*											6	
06												9	
09	*											12	
12												24	
15				*									
18													
21													
Avg	*	*	*	*	*	*	*	*	*	*	*	1	2
N = 15													
00	2	1	1	*								1	1.00
03	2	1	1	*								3	0.71
06	*	3	3	1								6	0.45
09	3	7	3	2	2	2	*					9	0.25
12	3	9	6	2	2	2	*					12	0.15
15	3	8	7	2	2	2	*					3	0.01
18	3	5	5	2	1	1	*					3	
21	3	6	4	2	2	1	*					3	
Avg	2	5	4	2	1	*	*					1	2

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.
 * <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 18
OCCURRENCE OF DUST - TESSALIT, MALI (Jun 50 - Dec 67)

FIGURE 3 STATION 14

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility <1 km)													
N = 6													
00	3					1							1
03	2					1	*						3
.06	1	*				1	2						6
.09	1	*	1	*		1	2	*	*				9
12	1	1	1	*		1	3	1	*	*			12
15	2	1	1	1		3	1	1	*	*			24
18	1	1	3	1		5	1	2		1			0.01
21													
Avg	*	1	1	*	2	1	1	*	*	*	*	*	

43

N = 43	BLOWING DUST (visibility <1 km)												
00	1	1	1	3	2	10	2	7	1	1	1	1	1.00
03	1	1	2	2	3	15	4	6	2	1	3	3	0.70
06	1	2	6	4	5	17	9	8	4	2	6	6	0.46
09	1	3	6	7	5	17	13	11	5	1	4	9	0.24
12	2	4	8	7	5	16	12	12	8	1	2	3	0.13
15	2	4	10	8	6	19	10	11	7	2	2	3	0.01
18	1	2	5	8	2	13	6	8	3	1	1	1	
21	1	2	2	10	1	15	4	6	1	1	2	1	
Avg	1	3	6	6	4	16	9	9	5	1	1	2	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 19

OCCURRENCE OF DUST - TOMBOUTOU, MALI (Apr 49 - Dec 67)

FIGURE 3 STATION 15

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
DUST STORMS (visibility < 1 km)														
00													1	1.00
03													3	0.20
06													6	0.03
09	*	*	*	*	*	*	*	*	*	*	*	*	9	
12													12	
15													24	
18														
21														
Avg	*	*	*	*	*	*	*	*	*	*	*	*		
BLLOWING DUST (visibility < 11 km)														
00	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
03	1	1	1	1	1	1	1	1	1	1	1	1	3	0.59
06	1	1	1	1	1	1	1	1	1	1	1	1	6	0.27
09	3	5	6	6	5	5	5	2	*	1	*	2	9	0.12
12	6	6	6	5	5	5	5	6	3	1	1	2	12	0.05
15	4	6	3	6	5	5	4	4	2	*	1	*	24	0.01
18	1	1	*	4	3	2	1	1	1	1	1	*	1	
21	1	1	1	4	3	1	1	1	1	1	1	1		
Avg	2	3	3	4	3	3	3	1	*	1	*	1	1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 20

OCCURRENCE OF DUST - AKJOUJT, MAURITANIA (May 49 - Dec 67)

FIGURE 3 STATION 16

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor ≥	
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 5														
02														1.00
05														0.37
08			*	1	2	1		1	*	1	*	1		0.04
11			*	1	2	1		1	*	1	*	1		0.01
14							*	1						
17														
20														
23														
Avg	*	1	*											
N = 40														
02			2					3	3	7	3	2		1.00
05			1		1			2	2	4	2			0.54
08			2		5	7	10	3	5	4	5	1	1	0.23
11			9	10	10	6	6	14	6	4	5	2	3	0.08
14			10	7	7	2	6	11	5	4	5	3	3	0.02
17			6	2	2		1	4	4	4	4	4	1	12
20			5					3	3			8		24
23			3					3	3			4		
Avg	6	5	6	3	5	9	5	4	4	4	4	2	2	3

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 21

OCCURRENCE OF DUST - ATAR, MAURITANIA (Apr 49 - Dec 67)

FIGURE 3 STATION 17

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours \geq	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
DUST STORMS (visibility < 1 km)														
02	1	4			1	2	2			*	1		1	1.00
05	1	4			1	1	1	*					3	0.52
08	1	2		*	1	1	1	*					6	0.24
11	1	1	*		1	1	1						9	0.06
14	1	1		*	1	*							12	0.05
17	1	1			1		1						24	0.01
20	1	1			1									
23	1	3			1									
Avg	1	2	*		*		*	1	1	*	*	*		

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours \geq	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
BLOWING DUST (visibility < 1 km)														
02	8	15	14	5	4	7	13	11	6	2	1	2	1	1.00
05	7	11	14	6	4	7	14	12	8	2	1	2	3	0.67
08	6	11	13	5	5	6	10	10	7	3	1	4	6	0.42
11	10	13	14	9	7	11	10	8	9	4	4	7	9	0.20
14	12	16	18	7	10	11	13	11	9	4	5	9	12	0.13
17	10	11	15	4	4	10	9	10	6	3	1	6	24	0.03
20	9	14	13	5	3	7	9	10	7	2	1	3		
23	6	13	12	3	2	6	13	7	7	1	1	2		
Avg	9	13	14	6	5	8	11	10	8	3	2	5		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.
 * <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 22

OCCURRENCE OF DUST - BOUTILIMIT, MAURITANIA (Apr 49 - Dec 67)

FIGURE 3 STATION 18

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours \geq	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 3												DUST STORMS (visibility <1 km)		
02													1	1.00
05		1											3	0.48
08	*	2		1	*	1	*						6	0.21
11	*	1	1	1	*	1	*						9	0.04
14	1	1	1	1	*	1							12	
17													24	
20														
23														
Avg	*	1	*	*	*	*	*	*	*	*	*	*		
N = 36												BLOWING DUST (visibility <1 km)		
02	5	5	4	3	2	7	3	1	2	1	1	3	1	1.00
05	5	9	6	6	5	9	7	2	2	1	1	2	3	0.59
08	10	13	10	7	6	7	2	2	1	1	1	6	6	0.32
11	12	16	11	5	8	9	5	3	2	1	1	8	9	0.11
14	5	8	4	1	2	9	4	2	2	2	1	4	12	0.05
17													24	0.01
20														
23														
Avg	7	9	7	4	4	7	2	1	1	1	1	4		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 23

OCCURRENCE OF DUST - FORT GOURAUD, MAURITANIA (May 49 - Dec 67)

FIGURE 3 STATION 19

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility <1 km)													
N = 2													
02													1
05													3
08													0.42
11	*	*											6
14													0.23
17													9
20													12
23													24
Avg	*	*						*	1		*	*	
BLLOWING DUST (visibility <11 km)													
N = 17													
02	2	3	8	5	5	10	14	5	7	5	4		4
05	3	2	6	4	3	4	4	1	5	4	2		1
08	2	6	8	3	2	4	1	1	3	3	1		1
11	6	6	6	5	4	5	5	1	3	5	5		1
14	6	6	3	3	6	3	1	1	5	5	6		1
17	3	3	2	5	15	14	14	9	5	2	4		3
20	8	3	3	10	10	14	5	7	6	4	9		3
23	3	3	3	10	14	5	7	6	5	4	9		5
Avg	4	5	4	5	5	1	5	4	4	4	*	1	3

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 24

OCCURRENCE OF DUST - FORT TRINQUET, MAURITANIA (Jan 57 - Dec 67)

FIGURE 3 STATION 20

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor ≥ Hours	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
DUST STORMS (visibility <1 km)														
N = 3														
02	6												1	1.00
05	2	2											3	0.47
08	1												6	0.21
11	1	1											9	0.04
14	2												12	0.04
17	1	2											24	0.04
20	3													
23	6													
Avg	49													
													*	*
BLOWING DUST (visibility <11 km)														
N = 17														
02	16	11											2	1.00
05	4	6	*										3	0.62
08	3	3	4	3									6	0.34
11	6	5	5	3									9	0.14
14	6	6	4	1	1								12	0.09
17	6	9	1	4	2								24	0.02
20	16	18		10										
23	16	11		3										
Avg	7	7	3	3	*									
													*	*

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 25

OCCURRENCE OF DUST - KIFFA, MAURITANIA (Jan 57 - Dec 67)

FIGURE 3 STATION 21

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥ 2	Decimal Percent
N = 6														
02													1	1.00
05													3	0.27
08													6	0.07
11	2	2	1	1	1	1	1	1	1	1	*		9	
14													12	
17													24	
20														
23														
Avg														
50	*	1	*	*	*	*	*	*	1	*	*			
N = 32														
02													3	1.00
05	2	4	2	1	2	1	4	4	1	1	1	1	3	0.54
08													6	0.26
11	7	10	8	6	11	6	11	6	3	1	2	1	9	0.08
14	10	10	12	8	5	7	5	7	3	1	3	1	12	0.03
17	3	7	4	3	4	3	2	3	2	1	1	1	24	
20		6	7	4	7	4	6	6	3	6	4	4		
23														
Avg														
5	6	6	4	4	4	4	2	*		1	*	4		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 26

OCCURRENCE OF DUST - NEMA, MAURITANIA (Jan 50 - Dec 67)

FIGURE 3 STATION 22

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor						
	J	F	M	A	M	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 0.4 DUST STORMS (visibility < 1 km)													
00												1	1.00
03												3	0.39
.06												6	0.19
.09												9	
12	*											12	
15		*										24	
18			*										
21				*									
Avg	8	8	6	8	6	5	*	*	*	*	2	1	4
N = 36 BLOWING DUST (visibility < 1 km)													
00	4	5	2	5	2	3					1	1	1.00
03	5	4	1	4	2	2					1	4	0.55
06	5	6	1	8	7	5					2	2	0.28
09	14	9	14	14	8	5					1	2	0.09
12	11	9	11	11	8	4	*	*	1	3	3	6	0.03
15	5	10	7	6	5	6	1	1	1	1	1	2	0.01
18	6	7	2	2	3	4	1	1	1	1	1	1	
21	4	5	4	6	6								
Avg	8	8	6	8	6	5	*	*	*	*	2	1	4

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 27

OCCURRENCE OF DUST - NOUAKCHOTT, MAURITANIA (Apr 49 - Dec 67)

FIGURE 3 STATION 23

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 6												DUST STORMS (visibility <1 km)		
02												1	1	1.00
05												1	3	0.42
08												1	6	0.14
11	1	1	1	*	1	1	2					1	9	0.02
14	2	1	2	1	1	1	1					1	12	0.02
17	*	1	*	1	1	1	1					1	24	
20														
23														
Avg	1	1	1	*	*	*	1					*		
N = 37												BLOWING DUST (visibility <11 km)		
02												1	1	1.00
05												1	3	0.61
08	1	1	3	4	3	4	*	1	*	1	1	2	6	0.30
11	5	7	10	6	4	5	*	1	*	1	1	3	9	0.14
14	7	8	8	5	7	10	5	3	1	1	1	1	7	0.06
17	5	6	8	8	13	10	5	4	*	*	1	1	6	0.01
20	3	1	7	3	8	6	1	2	1	1	1	1	2	
23												*	2	
Avg	2	4	5	4	5	6	2	1	*	*	1	1	4	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 28

OCCURRENCE OF DUST - PORT ETIENNE, MAURITANIA (Apr 49 - Dec 67)

FIGURE 3 STATION 24

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 8												DUST STORMS (visibility <1 km)		
02												1	1.00	
05	1											3	0.48	
08	*	1										6	0.22	
11	*	1	1									9	0.04	
14	*	1	1	1								12	0.01	
17	*	1	1	1	2							24		
20					2	1								
23					1		1							
N = 130												BLOWING DUST (visibility <1 km)		
02	4	6	6	11	8	10	8	5	3	2	2	2	1	1.00
05	5	8	6	8	7	5	5	3	2	*	2	3	3	0.67
08	8	6	7	11	13	9	7	5	3	*	3	3	6	0.44
11	10	10	16	16	16	17	16	9	3	3	5	8	9	0.20
14	10	10	22	38	41	45	34	19	8	6	5	10	12	0.12
17	13	21	41	53	49	60	47	30	21	11	5	8	24	0.01
20	9	15	25	28	26	35	29	20	14	7	3	5		
23	4	7	6	11	7	13	9	6	4	2	2	2		
Avg	8	10	16	22	21	24	20	12	7	4	3	6		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 29

OCCURRENCE OF DUST - ROSSO, MAURITANIA (Jan 57 - Dec 67)

FIGURE 3 STATION 25

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor							
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 2														
02													1	1.00
05													3	0.59
08													6	0.31
11													9	0.12
14													12	0.06
17													24	0.01
20														
23														
Avg	*	*	*	*	*	*	*	*	*	*	*	*	1	2
N = 26														
02	1	1	4										1	1.00
05	1	2	3	1									3	0.59
08	3	4	5	2	3								6	0.31
11	9	7	10	2	2	1							9	0.12
14	8	6	9	1	3	6	1	3					12	0.06
17	4	4	5	2	6	3	3	2	1	1	1	1	2	0.01
20	3	3	7	5	2	5	2	3	2	1	1	1		
23	1	2	5											
Avg	4	4	6	1	2	2	1	1	*	*	*	1	2	

$N = \text{Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.}$

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 30

OCCURRENCE OF DUST - TIDJIKIA, MAURITANIA (Jun 49 - Nov 67)

FIGURE 3 STATION 26

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor		
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent	
N = 2		DUST STORMS (visibility <1 km)													
02													1	1.00	
05													3	0.36	
08	1			*		1	1		*	*			6	0.16	
11						1	1						9		
14							1						12		
17							1						24		
20								3							
23															
Avg		*		*		*		*	1	*	*				
55															
N = 37		BLOWING DUST (visibility <11 km)													
02									2	2			1	1.00	
05	1	2						1	1	1			3	0.54	
08	3	4	4					3	4	2	4		6	0.23	
11	8	14	10	6	5	9	5	2	4	4	3	4	9	0.08	
14	7	13	7	6	6	8	3	2	4	5	2	2	12	0.02	
17	4	4	3	1	2	3	1	3	1	2	2	2	24		
20															
23															
Avg		5	8	6	4	3	5	3	1	3	3	2	2		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 31

OCCURRENCE OF DUST - AGADEZ, NIGER (Apr 49 - Dec 67)

FIGURE 3 STATION 27

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 11														
01	1									*				1.00
04	*	1								1				0.42
07		2	2	2	1	2	*	*	*	*				0.16
10		2	2	1	1	2	*	*	*	*				0.02
13		2	1	1	1	2	*	*	1	1				
16		1	1	1	1	1	*	*	1	1				
19										*				
22										*				
Avg	1	1	*	1	*	1	*	*	*	*	*	*	1	
N = 27														
01	1	7				1	1							1.00
04	1	7				1	1							0.44
07	1	1	*			*								0.18
10	6	7	5	3	1	1	1	1	1	1				0.03
13	8	9	2	2	1	1	1	1	1	1				0.01
16	2	3	2	2	2	*	2	*	1	1				
19	*	2	1	2	1	1	2	1	1	1				
22		1							*					
Avg	3	4	1	1	1	1	*	*	1	*	*	*	1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

-like friend for 10% visibility condition lasting for 2 consecutive hours or time and a specified hour and month equals duration factor times diurnal variation by month.

TABLE 32

OCCURRENCE OF DUST - BILMA, NIGER (Apr 49 - Dec 67)

FIGURE 3 STATION 28

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours >	Decimal Percent
N = 4														
01													1	1.00
04	*	*	*	*	*	*	*	*	*	*	*	*	3	0.50
07	1	1	1	1	1	1	1	1	1	1	1	1	6	0.23
10	1	1	1	1	1	1	1	1	1	1	1	1	9	0.06
13	1	1	1	1	1	1	1	1	1	1	1	1	12	0.01
16													24	
19														
22														
Avg	*	1	*	1	*	*	*	*	*	*	*	*	*	*
N = 26														
01	6	2	5	4	2	3	1	1	2	2	2	2	3	1.00
04	8	2	5	4	3	3	1	2	2	2	2	2	6	0.60
07	6	10	9	8	5	2	1	4	3	2	2	2	9	0.34
10	6	10	8	10	6	3	2	1	1	2	2	2	12	0.13
13	4	5	5	4	3	1	*	*	*	1	1	1	1	0.05
16	1	2	2	*	*	*	*	*	*	*	*	*	*	
19	*	1	2	1	1	1	1	1	1	1	1	1	1	
22														
Avg	3	6	5	5	3	2	1	*	1	1	1	1	2	

N = Arithmetic mean of the annual occurrences of dust equal to or greater than 1-hour duration.

* 5%

Likelihood (%) of visibility condition 135 being seen at certain points of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 33

OCCURRENCE OF DUST - BIRNI N'KONI, NIGER (Apr 49 - Dec 67)

FIGURE 3 STATION 29

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor			
	J	F	M	A	S	O	N	D	Hours ≥ 24	Decimal Percent
N = 1 DUST STORMS (visibility < 1 km)										
00									1	1.00
03									3	0.30
06	*								6	0.10
09		*							9	
12			*						12	
15				*					24	
18					*					
21						*				
Avg	*	*	*	*	*	*	*	*		
N = 9 BLOWING DUST (visibility < 11 km)										
00									1	1.00
03									3	0.45
06	1	1	1	1	1	1	*	*	6	0.17
09	2	2	2	2	2	2	*	*	9	0.03
12	2	2	2	1	1	1	*	*	12	0.01
15	2	2	2	2	2	2	*	*	24	
18	*	*	*	*	*	*	1	1		
21							1	1		
Avg	1	1	1	*	*	*	*	*		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 34

OCCURRENCE OF DUST - MAINE-SOROA, NIGER (Apr 49 - Dec 67)

FIGURE 3 STATION 30

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 7														
01												1	1.00	
04												3	0.28	
07	4	2	*	*								6	0.08	
10	1	1	1	*	1	1						9		
13	*	1	1	1								12		
16												24		
19								*						
22								3						
59														
Avg	1	1	*	1							*			
N = 11														
01												1	1.00	
04												3	0.39	
07	4	2	*	*	1	*						6	0.14	
10	2	3	1	1	1	*						9	0.02	
13	1	5	2	1	1	1						12	0.01	
16	1	2	1	1	1	*						24		
19						*								
22						3								
Avg	1	3	1	1	1	1					*			

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 35

OCCURRENCE OF DUST - ZINDER, NIGER (Apr 49 - Dec 67)

FIGURE 3 STATION 3]

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor		
	J	F	M	A	M	J	J	A	S	O	N	D	Hours >	Decimal Percent	
N = 4															
01	*												1	1.00	
04													3	0.44	
07													6	0.03	
10	*												9	0.01	
13			*										12	0.01	
16	*			*				*					24		
19	*		*				1	*							
22	*							*							
Avg	*	1	*	*	*	*		*	*	*	*	*	1	1	
N = 11															
01	*	1				1	*				*		1	1.00	
04	*					*					*		3	0.45	
07	*				*						*		6	0.15	
10	*	2	*	1	*	1				*		1	9	0.04	
13	1	3	1	1	1	1				*		2	12	0.03	
16	1	1	*	*	1	1		*	*	1	*	1	24	0.01	
19	1	1	*	1	1	2		*	*	*	*	1			
22	1	1	*	1	1	1		*	*	*	*	1			
Avg	*	1	*	*	*	*	1	*	*	*	*	1	1	1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 36

OCCURRENCE OF DUST - LAS PALMAS (CANARY ISLANDS), SPANISH SAHARA (Mar 50 - Dec 67)

FIGURE 3 STATION 32

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 0.3												DUST STORMS (visibility < 1 km)		
02													1	1.00
05													3	0.88
08				*	1								6	0.88
11	*			*	1								9	0.58
14	*			*	1								12	0.58
17	*			*	*								24	
20	*			*	*									
23														
Avg	*	*												
N = 6												BLOWING DUST (visibility < 11 km)		
02	1	3	1	*									1	1.00
05	1	2	2	*									3	0.76
08	1	3	2	*									6	0.50
11	1	4	3	*									9	0.33
14	1	5	3	*									12	0.25
17	1	3	4	*									24	0.04
20	1	3	3	*										
23	1	3	2	*										
Avg	1	3	2	*										

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 37

OCCURRENCE OF DUST - VILLA CISNEROS, SPANISH SAHARA (Feb 50 - Dec 67)

FIGURE 3 STATION 33

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 4														
02	*												1	1.00
05													3	0.47
08	1	*											6	0.20
11	1	*	1										9	0.04
14	1			*	*								12	0.02
17	1			*	1								24	
20						1								
23							1							
Avg	1	*	*	*	*	*	*	*	*	*	*	*		
N = 49														
02	3	8	4	4	3	1	4	3	6	*	1	2	1	1.00
05	3	5	3	3	4	1	2	3	5	1	2	2	3	0.74
08	3	8	3	3	2	1	3	3	5	*	1	2	6	0.54
11	6	12	10	12	8	6	9	10	6	2	1	3	9	0.30
14	6	16	13	16	10	11	20	14	9	3	2	5	12	0.20
17	6	15	12	13	10	15	18	13	6	2	1	5	24	0.04
20	5	14	10	7	9	8	9	12	6	1	2	4		
23	3	8	4	4	3	1	3	3	6	*	1	2		
Avg	5	11	8	8	6	6	9	8	6	1	1	1	3	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 38

OCCURRENCE OF DUST - ALICE SPRINGS, AUSTRALIA (Jan 47 - Jun 58)

FIGURE 4 STATION 1

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 2														
02	*												1	1.00
05	*												3	0.74
08	*												6	0.49
11	*	*											9	0.31
14	*	*											12	0.12
17	*												24	
20	*													
23	*													
Avg	*	*	*	*									1	*
N = 7														
02	1	*	*										1	1.00
05	1		1										3	0.75
08	1		1										6	0.53
11	1		1										9	0.32
14	*	1		*									12	0.28
17	*	1		*									24	0.01
20	1	1		1										
23	1	1	*											
Avg	1	1	*	*	*								1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 39

OCCURRENCE OF DUST - KHOTAN/HOTTIEN, CHINA (Aug 56 - Dec 64)

FIGURE 5 STATION 2

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 42												DUST STORMS (visibility < 1 km)		
02	*	1	3	5	5	4	2	3	2	*	*		1	1.00
05	*	*	1	6	5	3	2	3	2	*	*		3	0.64
08	*	*	1	3	9	4	5	3	2	1	*		6	0.39
11	1	2	7	10	5	4	3	2	2	*	*		9	0.16
14	*	2	6	9	3	3	2	2	2	1	*		12	0.10
17	*	1	5	7	5	1	2	2	1	*	1		24	0.02
20	1	1	4	6	6	2	1	2	1	*				
23	1	1	3	7	3	2	1	2	1	*				
Avg	*	1	4	7	5	3	2	2	2	1	*	*		
N = 144												BLOWING DUST (visibility < 1 km)		
02	7	14	39	52	35	37	43	32	20	14	4	1	1	1.00
05	6	11	34	50	42	32	39	34	21	14	3	3	3	0.84
08	6	14	40	53	42	33	42	34	23	20	5	1	6	0.66
11	10	18	48	56	47	34	50	37	29	20	6	3	9	0.50
14	10	17	47	52	42	34	42	36	25	17	7	2	12	0.39
17	8	16	44	50	39	31	39	39	23	19	7	3	24	0.19
20	10	14	43	52	43	35	40	37	21	18	6	2		
23	9	14	39	54	39	35	42	31	20	15	5	1		
Avg	8	15	42	52	41	34	42	35	23	17	6	1		

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 40

OCCURRENCE OF DUST - LUGA (MALTA), ITALY (Jan 56 - Mar 71)

FIGURE 5 STATION 3

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 0.3													
01												1	1.00
04												3	0.39
07												6	0.20
10	*											9	
13	*	*										12	
16												24	
19													
22													
25													
Avg	*											*	

65

N = 11	BLLOWING DUST (visibility <1 km)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 11													
01	*	1	1	2	1	*	*	*	*	*	1	1	1.00
04	*	1	1	2	1	*	*	*	*	*	1	1	0.74
07	*	1	3	1	*	*	*	*	*	*	1	1	0.58
10	*	*	1	3	1	*	*	*	*	*	1	1	0.28
13	1	*	2	4	2	*	*	*	*	*	1	2	0.22
16	1	*	2	4	3	*	*	*	*	*	2	2	0.05
19	*	1	3	4	2	*	*	*	*	*	1	2	
22	1	2	4	2									
Avg	*	1	2	3	1	*	*	*	*	*	1	1	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 41

OCCURRENCE OF DUST - HAMHUNG, NORTH KOREA (Jan 59 - Aug 71)

FIGURE 5 STATION 4

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor			
	J	F	M	A	J	S	N	D	Hours ≥	Decimal Percent
N = 0.08 DUST STORMS (visibility <1 km)										
02	*	*	*	*	*	*			1	1.00
05	*	*	*	*	*	*			3	1.00
08	1	1	1	1	1	1			6	0.14
11	1	1	1	1	1	1			9	0.09
14	2	1	1	1	1	1	*	*	12	0.06
17	1	1	1	1	1	1	*	*	24	
20	*	1	1	1	1	1	*	*		
23	*	*	*	*	*	*	*	*		
Avg										
N = 7 BLOWING DUST (visibility <11 km)										
02	*	*	*	*	*	*			1	1.00
05	*	*	*	*	*	*			3	0.57
08	1	1	1	1	1	1	*	*	6	0.14
11	1	1	1	1	1	1	*	*	9	0.09
14	2	1	1	1	1	1	*	*	12	0.06
17	1	1	1	1	1	1	*	*	24	
20	*	1	1	1	1	1	*	*		
23	*	*	*	*	*	*	*	*		
Avg	1	1	1	1	1	1	*	*	*	*

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 42

OCCURRENCE OF DUST - HOENGSONG, SOUTH KOREA (Apr 51 - May 66)

FIGURE 5 STATION 5

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 0 DUST STORMS (visibility < 1 km)														
00													1	
03													3	
.06													6	
09													9	
12													12	
15													24	
18														
21														
Avg														
N = 10 BLOWING DUST (visibility < 11 km)														
00	*	*	*	*	*	*	*	*	*	*	*		1	1.00
03	*	*	*	*	*	*	*	*	*	*	*		3	0.45
06	*	*	*	*	*	*	*	*	*	*	*		6	0.11
09	*	*	*	*	*	*	*	*	*	*	*		9	0.04
12	*	*	*	*	*	*	*	*	*	*	*		12	0.01
15	*	*	*	*	*	*	*	*	*	*	*		24	
18	*	*	*	*	*	*	*	*	*	*	*			
21	*	*	*	*	*	*	*	*	*	*	*			
Avg														

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 43

OCCURRENCE OF DUST - CHIHUAHUA, MEXICO (Mar 52 - Mar 60)

FIGURE 6 STATION 1

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility < 1 km)													
N = 2													
02													1
05													3
08													6
11													9
14													12
17													24
20													
23													
Avg	*	*	*	*	*	*	*	*	*	*	*	*	*
68													

N = 35
BLOWING DUST (visibility < 1 km)

02	1	5	5	1									1
05	1	3	1	1									3
08	1	2	1	1									6
11	1	4	5	5	4	2							9
14	1	1	8	7	3	1	1						12
17	1	1	4	6	1	1	1						24
20	1	3	6	6	2	1	1						
23	2	3	3	3	1	1	1						
Avg	*	2	5	4	1	1	*	*	*	*	1	1	1

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 44

OCCURRENCE OF DUST - HERMOSILLO, MEXICO (Apr 49 - May 54)

FIGURE 6 STATION 2

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours ≥	Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D		
N = 0.2	DUST STORMS (visibility < 1 km)												1	1.00
02													3	1.00
05													6	
08													9	
11													12	
14													24	
17														
20														
23														
Avg	*	*	*	*	*	*	*	*	*	*	*	*	*	*
N = 16	BLOWING DUST (visibility < 11 km)												1	1.00
02													3	0.34
05													6	0.05
08													9	0.01
11													12	
14													24	
17														
20														
23														
Avg	*	*	*	*	*	*	*	*	*	*	*	*	*	*

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 45

OCCURRENCE OF DUST - MONCLOVA, MEXICO (Jan 49 - Mar 60)

FIGURE 6 STATION 3

Hour (LST)	Diurnal Variation by Month (%)						Duration Factor							
	J	F	M	A	M	J	J	A	S	O	N	D	Hours ≥	Decimal Percent
N = 0.6														
02	*												1	1.00
05													3	0.79
08													6	0.59
11													9	0.39
14	*												12	0.39
17	1	*											24	
20	1	*												
23	1	*												
Avg	*	*												
N = 68														
02	1	4	6	5	3	3	1	1	*	3	*	1	1	1.00
05	*	2	3	2	*	3	1	1	*	*	*	2	3	0.52
08	1	3	5	3	3	3	1	1	2	2	2	3	6	0.20
11	2	4	9	6	3	3	*	*	*	2	2	3	9	0.07
14	3	5	9	7	3	7	3	*	*	2	2	4	12	0.04
17	4	7	7	6	3	6	3	*	*	3	3	4	24	0.01
20	4	2	10	1	1	1	*	*	*	1	1	*		
23	1	4	7	4	1	1	*	*	*	2	1			
Avg	2	4	7	5	2	1	*	1	*	1	1	1	2	

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 46

OCCURRENCE OF DUST - TORREON, MEXICO (Jan 49 - Mar 60)

FIGURE 6 STATION 4

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor ≥
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 30													
02	1	*	1	*	1		1		*	*			1
05	1	*	1	*	1		1		*	*			3
08	*	1	1	1	*		1		1				0.44
11	1	1	2	2	1		1		1				6
14	1	1	2	2	3	1	4	2	2	1			0.10
17	1	2	2	2	3	1	3	4	2	1			0.03
20	2	1	1	1	1	1	1	1	*	*			0.01
23	1	1	1	1	1	1	1	1	*	*			24
Avg	1	1	1	1	1	1	1	1	*	*	*	1	
N = 205													
02	2	5	8	8	5	4	4	4	2	2	2	2	1
05	2	3	3	2	1	2	1	*	2	2	2	2	3
08	4	4	6	5	4	2	1	1	2	4	5	4	0.44
11	5	9	9	11	6	5	1	1	1	2	4	4	6
14	6	9	13	14	10	4	1	1	2	4	4	5	0.13
17	7	8	13	14	10	8	7	7	6	6	5	4	0.04
20	5	5	7	11	9	15	12	7	5	2	2	1	12
23	1	5	4	8	7	5	3	2	1	1	1	1	0.01
Avg	4	6	8	9	7	6	4	3	3	2	3	3	0.01

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* < 0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 47

OCCURRENCE OF DUST - LIMA/CALLAO, PERU (Nov 60 - Dec 69)

FIGURE 6 STATION 5

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor	
	J	F	M	A	M	J	J	A	S	O	N	D	Hours >	Decimal Percent
N = 0														
01													1	1.00
04													3	0.47
07													6	0.19
10													9	0.04
13													12	0.01
16													24	
19														
22														
NONE REPORTED														
Avg														
N = 7														
01	*												1	1.00
04													3	0.47
07													6	0.19
10													9	0.04
13													12	0.01
16													24	
19														
22														
Blowing Dust (visibility <1 km)														
01	*												1	1.00
04													3	0.47
07													6	0.19
10													9	0.04
13													12	0.01
16													24	
19														
22														
Avg														

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 48

OCCURRENCE OF DUST - TALARA, PERU (Jan 49 - Dec 67)

FIGURE 6 STATION 6

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor Hours > Decimal Percent
	J	F	M	A	M	J	J	A	S	O	N	D	
N = 0	DUST STORMS (visibility <1 km)												
01													1
04													3
07													6
10													9
13													12
16													24
19													
22													
Avg													
N = 9	BLOWING DUST (visibility <11 km)												
01													1
04													1.00
07													3
10													0.44
13	*												6
16													0.24
19													9
22													12
Avg	*	*	*	*	*	*	*	*	*	*	*	*	24

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

*<0.5%

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

TABLE 49
OCCURRENCE OF DUST - CARACAS, VENEZUELA (Jan 49 - Dec 70)

FIGURE 6 STATION 7

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor $\frac{\text{Hours}}{\geq}$
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility < 1 km)													
02	2	2	*	1									1
05	2	2	*	1									3
08			*										6
11	*												9
14													12
17													24
20	1	1	*	*									
23	1	1	*	*									
Avg	1	1	*	*									
BLOWING DUST (visibility < 11 km)													
02	2	2	3	1									1
05	2	2	3	1									3
08	1	2	2	2	1								6
11		2	2	1									*
14	1	1	*	1									
17	1	*	1	*									
20	1	2	2	*	*								
23	1	3	2	*	1								
Avg	1	2	2	*	*								

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

* <0.5%

Hour (LST)	Diurnal Variation by Month (%)												Duration Factor $\frac{\text{Hours}}{\geq}$
	J	F	M	A	M	J	J	A	S	O	N	D	
DUST STORMS (visibility < 1 km)													
02	2	2	*	1									1
05	2	2	*	1									3
08	1	2	2	2	1								6
11		2	2	1									*
14	1	1	*	1									
17	1	*	1	*									
20	1	2	2	*	*								
23	1	3	2	*	1								
Avg	1	2	2	*	*								
BLOWING DUST (visibility < 11 km)													
02	2	2	3	1									1
05	2	2	3	1									3
08	1	2	2	2	1								6
11		2	2	1									*
14	1	1	*	1									
17	1	*	1	*									
20	1	2	2	*	*								
23	1	3	2	*	1								
Avg	1	2	2	*	*								

N = Arithmetic mean of the annual number of occurrences of dust equal to or greater than 1-hour duration.

Likelihood (%) of a visibility condition lasting for a certain period of time at a specified hour and month equals duration factor times diurnal variation by month.

INDEX

STATIONS ALPHABETICALLY SUMMARIZED

<u>Name and Country</u>	<u>Table (s)</u>
Agadez, Niger	1, 31
Akjoujt, Mauritania	1, 20
Alexandroupolis, Greece	4
Alice Springs, Australia	2, 38
Amapala, Honduras	4
Amboina, Indonesia	4
Ambrizete, Angola	4
Amendola, Italy	4
Aranyaprathet, Thailand	4
Atar, Mauritania	1, 21
Athens, Greece	4
Augsburg, West Germany	4
Bacau, Rumania	4
Bamako, Mali	1, 7
Bandjermasin/Ulin, Indonesia	4
Ban Don, Thailand	4
Bangkok, Thailand	4
Ban Mae Sariang, Thailand	4
Barcelona, Venezuela	4
Bari/Palese Macchie, Italy	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Barranquilla/Soledad, Colombia	4
Batticaloa, Sri Lanka	4
Belize, Belize	4
Berlin/Tempelhof, East Germany	4
Bilma, Niger	1, 32
Birlad, Rumania	4
Birni N'Koni, Niger	1, 33
Blavand, Denmark	4
Bogota/El Dorado, Colombia	4
Bolzano, Italy	4
Bonifati, Italy	4
Botosani, Rumania	4
Bougouni, Mali	4
Boutilimit, Mauritania	1, 22
Bremen, West Germany	4
Bremerhaven, West Germany	4
Brindisi, Italy	4
Bucharest, Rumania	4
Burgas, Bulgaria	4
Cagliari/Elmas (Sardinia), Italy	4
Calarasi, Rumania	4
Campobasso, Italy	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Caracas, Venezuela	3, 49
Catacamas, Honduras	4
Catania/Sigonella (Sicily), Italy	4
Cela, Angola	4
Chanthaburi, Thailand	4
Cherni Vrah, Bulgaria	4
Chiang Mai, Thailand	4
Chiang Rai, Thailand	4
Chiclayo, Peru	4
Chihuahua, Mexico	3, 43
Chongjin, North Korea	4
Choybalsan, Mongolia	4
Chumphon, Thailand	4
Chungganjin, North Korea	4
Ciudad Bolivar, Venezuela	4
Cluj, Rumania	4
Colombo, Sri Lanka	4
Constanta, Rumania	4
Copenhagen/Kastrup, Denmark.	4
Coro, Venezuela	4
Cozzo Spadaro (Sicily), Italy	4
Crotone, Italy	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Dueodde, Denmark	4
Emden, West Germany	4
Entebbe, Uganda	4
Fichtelberg, East Germany	4
Florina, Greece	4
Fornaes, Denmark	4
Forrest, Australia	4
Fort Gouraud, Mauritania	1, 23
Fort Trinquet, Mauritania	1, 24
Frankfurt/Ming, West Germany	4
Friedrichshafen, West Germany	4
Galati, Rumania	4
Gao, Mali	1, 8
Geneva/Cointrin, Switzerland	4
Girardot, Colombia	4
Gorlitz, East Germany	4
Graz, Austria	4
Guanaja, Honduras	4
Guatemala City, Guatemala	4
Guayaquil/Simon Bolivar, Ecuador	4
Guiria, Venezuela	4
Gulu, Uganda	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Haeju, North Korea	4
Hambantota, Sri Lanka	4
Hamburg, West Germany	4
Hamhung, North Korea	2, 41
Helsinki, Finland	4
Henrique De Carvalho, Angola	1, 5
Hermosillo, Mexico	3, 44
Hesan, North Korea	4
Hoengsong, South Korea	2, 42
Hof, West Germany	4
Hombori, Mali	4
Hua Hin, Thailand	4
Hua-Tien, China	4
Iasi, Rumania	4
Innsbruck, Austria	4
Ioannina, Greece	4
Iraklion (Crete) Greece	4
Kalgoorlie, Australia	4
Kaltennordheim, East Germany	4
Kanchanaburi, Thailand	4
Kange, North Korea	4
Kangnung, South Korea	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Kankesanturai, Sri Lanka	4
Kansong, South Korea	4
Karup, Denmark	4
Kassel, West Germany	4
Kayes, Mali	1, 9
Kenieba, Mali	1, 10
Kerkira, Greece	4
Khania (Crete), Greece	4
Khios, Greece	4
Khlong Yai, Thailand	4
Khon Kaen, Thailand	4
Khotan/Hotien, China	2, 39
Kiffa, Mauritania	1, 25
Kimchaek, North Korea	4
Kimi, Greece	4
Kisumu, Kenya	4
Kita, Mali	1, 11
Klagenfurt, Austria	4
Kolarovgrad, Bulgaria	4
Koutiala, Mali	1, 12
Kunsan, South Korea	4
Kwandae Ri, South Korea	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Kwangju, South Korea	4
Kyustendil, Bulgaria	4
Lampedusa, Italy	4
La Orchila, Venezuela	4
Larisa, Greece	4
Las Palmas (Canary Islands), Spanish Sahara	1, 36
Leipzig/Mockau, East Germany	4
Levkas, Greece	4
Lienz, Austria	4
Lima/Callao, Peru	3, 47
Limnos, Greece	4
Linz, Austria	4
Lobito, Angola	4
Locarno, Switzerland	4
Loei, Thailand	4
Lom, Bulgaria	4
Lop Buri, Thailand	4
Los Rodeos (Canary Islands), Spanish Sahara	4
Luga (Malta), Italy	2, 40
Luonetjarvi, Finland	4
Luso, Angola	4
Mae Hong Son, Thailand	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Mae Sot, Thailand	4
Magdeburg, East Germany	4
Maine-Soroa, Niger	1, 34
Makasar/Hassanuddin, Indonesia	4
Malanje, Angola	4
Managua, Nicaragua	4
Maracaibo, Venezuela	4
Maracay, Venezuela	4
Maradi, Niger	4
Mavinga, Angola	4
Medan, Indonesia	4
Meekatharra, Australia	4
Menaka, Mali	1, 13
Messina (Sicily), Italy	4
Methoni, Greece	4
Milano/Linate, Italy	4
Mocamedes, Angola	1, 6
Mombasa, Kenya	4
Monclova, Mexico	3, 45
Montevideo/Carrasco, Uruguay	4
Mopti, Mali	1, 14
Mukdahan, Thailand	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Munich, West Germany	4
Münster, West Germany	4
Nairobi, Kenya	4
Nakhon Phanom, Thailand	4
Nakhon Rat Sima, Thailand	4
Nakhon Sawan, Thailand	4
Nan, Thailand	4
Narathiwat, Thailand	4
Naxos, Greece	4
Nema, Mauritania	1, 26
Nguigmi, Niger	4
Niamey, Niger	4
Nioro Du Sahel, Mali	1, 15
Nouakchott, Mauritania	1, 27
Nova Lisboa, Angola	4
Nürnberg, West Germany	4
Odense/Beldringe, Denmark	4
Oraden, Rumania	4
Oristano/Capo della Frasca (Sardinia), Italy	4
Osan, South Korea	4
Paengnyong Do, South Korea	4
Palermo/Punta Raisi (Sicily), Italy	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Pantelleria, Italy	4
Passo Resia, Italy	4
Perth, Australia	4
Phetchabun, Thailand	4
Phitsanulok, Thailand	4
Phuket, Thailand	4
Pisa/San Giusto, Italy	4
Pisco, Peru	4
Pitesti, Rumania	4
Piura, Peru	4
Pleven, Bulgaria	4
Plovdiv, Bulgaria	4
Pohang, South Korea	4
Port Etienne, Mauritania	1, 28
Porto Amboim, Angola	4
Potenza, Italy	4
Prachuap, Thailand	4
P 8 Ship, West Germany	4
Puerto Ayacucho, Venezuela	4
Puerto Limon, Costa Rica	4
Pusan East, South Korea	4
Puttalam, Sri Lanka	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Puyo, Ecuador	4
Pyongyang, North Korea	4
Ranong, Thailand	4
Regensburg, West Germany	4
Riobamba, Ecuador	4
Roi Et, Thailand	4
Rosso, Mauritania	1, 29
Ruse, Bulgaria	4
Saarbrücken, West Germany	4
Sachon, South Korea	4
Sakon Nakhon, Thailand	4
Salsburg, Austria	4
Salto, Uruguay	4
Samos, Greece	4
San, Mali	1, 16
San Antonio, Venezuela	4
Sandanski, Bulgaria	4
San Fernando, Venezuela	4
San Jose/El Coco, Costa Rica	4
San Jose/La Sabana, Costa Rica	4
San Juan, Peru	4
San Lorenzo, Ecuador	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
San Marcos, Colombia	4
San Salvador/Ilopango, El Salvador	4
Santa Elena, Venezuela	4
Santa Rosa de Copan, Honduras	4
Sariwon, North Korea	4
Sattahip, Thailand	4
Satu Mare, Rumania	4
Saynshand, Mongolia	4
Schleswig, West Germany	4
Segou, Mali	1, 17
Seoul Kimpo, South Korea	4
Serpa Pinto, Angola	4
Sibiu, Rumania	4
Sikasso, Mali	4
Silven, Bulgaria	4
Sinuiju, North Korea	4
Sion, Switzerland	4
Skagen, Denmark	4
Smolyan, Bulgaria	4
Sodankyla, Finland	4
Sofiya, Bulgaria	4
Songkhla, Thailand	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Sulina, Rumania	4
Surabaja/Perak, Indonesia	4
Surin, Thailand	4
Taegu, South Korea	4
Taejon, South Korea	4
Talara, Peru	3, 48
Tegucigalpa, Honduras	4
Tela, Honduras	4
Tessalit, Mali	1, 18
Thessaloniki, Greece	4
Thorshaven (Faroe Islands), Denmark	4
Tidjika, Mauritania	1, 30
Timbakion, Greece	4
Timisoara, Rumania	4
Tirgu Mures, Rumania	4
Tombouctou, Mali	1, 19
Tongouchou, South Korea	4
Torreon, Mexico	3, 46
Trang, Thailand	4
Trapani/Birgi (Sicily), Italy	4
Trier, West Germany	4
Turnu Magurele, Rumania	4

Index (cont)

<u>Name and Country</u>	<u>Table (s)</u>
Turnu Severin, Rumania	4
Ubon Ratchathani, Thailand	4
Udon Thani, Thailand	4
Ueckermunde, East Germany	4
Ulan Bator, Mongolia	4
Ungg, North Korea	4
Varna, Bulgaria	4
Venezia/San Nicolo, Italy	4
Vienna, Austria	4
Villa Cisneros, Spanish Sahara	1, 37
Vrf Omul, Rumania	4
Wittenberge, East Germany	4
Wonsan, North Korea	4
Woomera, Australia	4
Würzburg, West Germany	4
Zakinthos, Greece	4
Zinder, Niger	1, 35
Zugspitze, West Germany	4
Zurich/Kloten, Switzerland	4

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